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*Transmitted via Email*

October 14, 2020

Ms. Lisa Denmark  
Remedial Project Manager  
U.S. Environmental Protection Agency  
Hazardous Site Cleanup Division, 3HS23  
1650 Arch Street  
Philadelphia, PA 19103

**RE: QUARTERLY PROGRESS REPORT FOR THE AVTEX FIBERS SUPERFUND SITE FOR THE  
PERIOD JULY 1 THROUGH SEPTEMBER 30, 2020 (THIRD QUARTER)**

Dear Ms. Denmark,

This Quarterly progress report addresses the reporting requirements in 1999 Consent Decree between the United States of America and FMC Corporation to conduct removal and remedial actions. In accordance with Section XI, Paragraph 45 of the Consent Decree, FMC has prepared this progress report to describe actions taken pursuant to the Consent Decree during the third quarter of 2020.

If you have any questions or comments, please call me at 215-299-6047.

Sincerely,

A handwritten signature in black ink, appearing to read 'B. McGinnis', with a long horizontal flourish extending to the right.

Brian McGinnis  
*Senior Remediation Manager*

Enclosure (1)

cc: C. Marquette, B. Kiracofe, VADEQ  
H. Philip, Parsons  
M. Robinson, Parsons



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## 1.0 INTRODUCTION

FMC Corporation (FMC) has conducted removal and remedial activities at the Avtex Fibers Superfund Site, Front Royal, Virginia (Site). The removal action, remedial design, and remedial action activities were performed pursuant to the 1999 Consent Decree between the United States of America and FMC Corporation (effective 21 October 1999).

Upon completion of the Groundwater Leachate Treatment Plant (GLTP) in 2014 following Site remediation activities, the Site transitioned into the Operations and Maintenance (O&M) phase. This report documents the O&M and monitoring activities and findings for the third quarter reporting period July 1 through September 30, 2020. Daily operations and maintenance activities are ongoing and meet the requirements in the *Sitewide O&M Plan* (FMC, May 2015).

In accordance with Section XI of the Consent Decree, this quarterly progress report contains the following:

- Description of actions taken, reports prepared, and a summary of data generated by FMC during the third quarter (July, August, and September 2020).
- Actions scheduled for the next quarter (October, November, and December 2020).
- Description of the problems encountered this quarter and actions taken to mitigate these problems.
- Update on the schedule of actions and percent completion of tasks.
- Modification to work plans or other schedules.
- Activities undertaken in support of the U.S. Environmental Protection Agency (USEPA) Community Relations Plan.

**Attachment 1** lists correspondence and deliverables transmitted from FMC or FMC contractors to USEPA and the Virginia Department of Environmental Quality (VADEQ), and from USEPA, USEPA contractors or VADEQ to FMC during the third quarter of 2020.

## 2.0 OU-7, OU-10, AND NON-TIME CRITICAL REMOVAL AND REMEDIAL ACTIONS

### 2.1 ACTIONS TAKEN AND REPORTS PREPARED (THIRD QUARTER 2020)

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- Completed quarterly inspection as described in Section 6 of Part 1 of the *Sitewide O&M Plan*. The results are presented in **Attachment 2**.
- Quarterly monitoring of gas vents was completed as described in Section 3.0 of Part 1 of the *Sitewide O&M Plan* and as amended by the February 28, 2018 letter from USEPA with the subject "Proposed Modification to the Passive Gas Vent and Gas Vent Filter System Inspection, Monitoring and Maintenance Section of the Sitewide Post-Closure Care Operations and Maintenance Plan (May 2015)."



- Quarterly post-closure OU-7 and site perimeter real-time air monitoring was completed as required by Section 2.2 of the *Air Monitoring Plan Operable Unit 7, Avtex Fibers Superfund Site, Front Royal, Virginia* (October 2011). The results are presented in **Attachment 3**. In addition, the annual air sampling event was conducted in August 2020.

## 2.2 DATA GENERATED (THIRD QUARTER 2020)

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As required by the *Air Monitoring Plan* (2011), post-construction annual air sampling for reduced sulfur compounds was conducted in August 2020 and quarterly air monitoring for hydrogen sulfide and organic vapors was completed in September 2020. The results of the quarterly air monitoring and annual air sampling are provided in **Attachment 3**.

The quarterly air monitoring results indicated:

- Hydrogen sulfide was not detected at any OU-7 or Site perimeter sample locations in September 2020.
- No volatile organic compounds (VOCs) were detected at any of the monitoring locations.

The following instruments were utilized to collect the real-time readings:

- Hydrogen sulfide: Jerome 613X
- Organic vapor: MiniRAE 3000

The results of annual air sampling conducted in August 2020 have been received and validated. A table summarizing the results along with the data validation report and laboratory analytical report are presented as **Attachment 3**.

Only four constituents were detected in this round of annual air samples: carbon disulfide, carbonyl disulfide, hydrogen sulfide, and methyl disulfide. The industrial screening level for hydrogen sulfide of 8.8 micrograms per cubic meter ( $\mu\text{g}/\text{m}^3$ ) was exceeded at one location (OU-7-N). The residential screening level for hydrogen sulfide of  $2.1 \mu\text{g}/\text{m}^3$  was exceeded at seven locations: OU-7-N, OU-7-NE, OU-7-SW, PERIM-DOWNWIND(N), PERIM-E, PERIM-N, and PERIM-SE. No other constituents exceeded a screening level.

## 2.3 ACTIONS TO BE COMPLETED NEXT PERIOD (FOURTH QUARTER 2020)

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- Complete quarterly inspection as described in Section 6 of Part 1 of the *Sitewide O&M Plan*.
- Complete quarterly monitoring of gas vents as described in Section 3.0 of Part 1 of the *Sitewide O&M Plan* and as amended by the February 28, 2018 letter from USEPA with the subject "Proposed Modification to the Passive Gas Vent and Gas Vent Filter System Inspection, Monitoring and Maintenance Section of the Sitewide Post-Closure Care Operations and Maintenance Plan (May 2015)."
- Complete quarterly post-closure OU-7 and site perimeter real-time air monitoring as required by Section 2.2 of the *Air Monitoring Plan Operable Unit 7, Avtex Fibers Superfund Site, Front Royal, Virginia* (October 2011).
- Conduct the quarterly stormwater inspection.



- Conduct annual wetland survey.

## 2.4 PROBLEMS ENCOUNTERED AND REMEDIES (THIRD QUARTER 2020)

No problems were encountered during the reporting period.

## 3.0 GROUNDWATER AND LEACHATE TREATMENT PLANT (GLTP)

### 3.1 ACTIONS TAKEN AND REPORTS PREPARED (THIRD QUARTER 2020)

The GLTP operated and discharged to the South Fork Shenandoah River (River) for 92-days, from July 1 to September 30, 2020.

Discharge monitoring was completed as required by the July 24, 2014, VADEQ Final Fact Sheet and Applicable or Relevant and Appropriate Requirements (ARARs) for the discharge of effluent from the GLTP. Monthly discharge monitoring included: flow, pH, five-day biological oxygen demand (BOD<sub>5</sub>), total suspended solids (TSS), and carbon disulfide (CS<sub>2</sub>). The daily maximum and monthly average flow and constituents of concern data are listed in the Discharge Monitoring Reports (DMRs), which were submitted during the third quarter of 2020 and are summarized in Table 1.

**Table 1. Summary of 3Q2020 Monthly Effluent Sampling**

Parameter	Units	Permit Limits	July 2020		August 2020		September 2020	
			monthly avg	daily max	monthly avg	daily max	monthly avg	daily max
Flow	MGD	0.396	0.067	0.095	0.066	0.114	0.060	0.113
pH	S.U.	6.5 – 9.0*	7.2 – 7.6		7.2 – 7.9		7.2 – 7.9	
BOD <sub>5</sub>	mg/L	24 / 64**	<QL	<QL	<QL	<QL	0.40	2.00
TSS	mg/L	40 / 130**	0.57	2.86	0.73	1.50	0.66	1.20
CS <sub>2</sub>	µg/L	0.1 mg/L***	<QL	<QL	<QL	<QL	<QL	<QL

Where parameters were non-detect, the value '0' was used for calculating average and maximum concentrations.  
 \* = Permit limit range for pH as specified in the ARARs.  
 \*\* = These values represent monthly average and daily maximum permit limits.  
 \*\*\* = There is no established permit limit for CS<sub>2</sub>. The value is a monthly action level specified in ARAR.  
 MGD = million gallons per day  
 S.U. = standard units  
 mg/L = milligrams per liter  
 µg/L = micrograms per liter  
 <QL = reported less than the quantitation limit

Discharge flow was monitored continuously. Additionally, flow rates for the lift stations, test wells and viscose basins for the months of July, August, and September 2020, are provided in Table 4.1 of Attachment 4.

The pH was monitored continuously during discharge. The pH monitoring results for each month of the reporting period were included with the monthly DMRs. The effluent pH was within the range of 6.5 to 9.0, as specified in the ARARs.

BOD<sub>5</sub> was monitored weekly. The permitted monthly daily average limit for BOD<sub>5</sub> of 24 mg/L and the permitted monthly maximum daily limit of 64 mg/L were not exceeded during the reporting period. The July and August 2020 BOD<sub>5</sub> monthly average and daily maximum concentrations were below the method detection limit / quantitation limit. The September 2020 monthly average and daily maximum concentrations were 0.40 mg/L and 2.00 mg/L, respectively.

TSS was also monitored weekly. The permitted monthly daily average limit for TSS of 40 mg/L and the permitted monthly maximum daily limit of 130 mg/L were not exceeded during the reporting period. The July 2020 TSS monthly average and daily maximum concentrations were 0.57 mg/L and 2.86 mg/L, respectively; August 2020 monthly average and daily maximum concentrations were 0.73 mg/L and 2.86 mg/L, respectively; and September monthly average and daily maximum concentrations were 0.66 mg/L and 1.20 mg/L, respectively.

Carbon disulfide was monitored monthly. The results for the monthly samples collected in the third quarter of 2020 were less than the 0.1 mg/L monthly action level specified in the ARARs.

### 3.2 ACTION ITEMS AND DATA GENERATED (THIRD QUARTER 2020)

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Flow totals for the lift stations, test wells and viscose basin are contained in **Attachment 4** (Table 4.1). DMRs were submitted to the VADEQ and USEPA by the tenth of each month.

### 3.3 ACTIONS TO BE TAKEN NEXT PERIOD (FOURTH QUARTER 2020)

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- Continue operations and maintenance of the GLTP.
- Continue to collect GLTP system discharge samples as required by the July 24, 2014, VADEQ Final Fact Sheet and ARARs for the discharge of effluent from the GLTP.
- Collect quarterly depth to water measurements.

### 3.4 PROBLEMS ENCOUNTERED AND REMEDIES (THIRD QUARTER 2020)

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- A minor leak was identified at the Site sulfuric acid storage tank in early July 2020. The leak was contained and disposed of properly. The leak has since been stabilized, and FMC is in the process of replacing the tank.
- TW#2 is offline due to a transducer electrical issue. The necessary repair parts have been ordered and once received and will be installed and repaired.



## 4.0 OTHER SITE RELATED DOCUMENTS AND ITEMS

### 4.1 ACTIONS TAKEN AND REPORTS PREPARED (THIRD QUARTER 2020)

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Quarterly inspections of seep areas, river berms and gas vents were conducted, and inspection reports were completed.

As discussed in the Second Quarter 2020 Progress Report, the viscose basin repairs and gas vent extensions work were completed in late June 2020, with the exception of three small areas which were too wet due to continued rain in June 2020. These three areas were addressed in September 2020. The Addendum to Viscose Basin Repairs and Gas Vent Extensions Memorandum and photo log are presented in **Attachment 5**.

Rainfall data are presented in Table 4.2 (**Attachment 4**). A total of 13.1 inches of precipitation fell on the Site during the third quarter of 2020 (July, August, and September 2020). The total precipitation through the end of the third quarter of 2020 represents approximately 79% of the average Site total yearly precipitation of 39.6 inches.

### 4.2 ACTIONS TO BE TAKEN NEXT PERIOD (FOURTH QUARTER 2020)

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Quarterly inspections of seep areas, river berms and gas vents will be conducted, and inspection reports will be completed.

## ATTACHMENTS

- 1 Summary of Monthly Correspondence
- 2 Sitewide Quarterly Inspection Reports (with repairs photo log)
- 3 OU-7 and Site Perimeter Air Monitoring Results
- 4 GLTP Discharge Monitoring and Information
  - a. Table 4.1 – Monthly Flow Totals Avtex Site Lift Stations, Test Wells and Viscose Basin
  - b. Table 4.2 - Site Rainfall Data
- 5 Addendum to Viscose Basin Repairs and Gas Vent Extensions Memorandum



## **ATTACHMENT 1**

### **SUMMARY OF MONTHLY CORRESPONDENCE**

## ATTACHMENT 1

### LIST OF CORRESPONDENCE AND DELIVERABLES FOR THE PERIOD JULY 1, 2020 TO SEPTEMBER 30, 2020, AVTEX FIBERS SUPERFUND SITE, FRONT ROYAL, VIRGINIA

#### FMC to VADEQ

- July 7, 2020: *June DMR - Avtex Fibers Site, Front Royal, VA* - June 2020 Discharge Monitoring Report Submission (submitted to VADEQ and EPA)
- August 7, 2020: *July DMR - Avtex Fibers Site, Front Royal, VA* - July 2020 Discharge Monitoring Report Submission (submitted to VADEQ and EPA)
- September 4, 2020: *August DMR - Avtex Fibers Site, Front Royal, VA* - August 2020 Discharge Monitoring Report Submission (submitted to VADEQ and EPA)

#### VADEQ to FMC

- July 20, 2020: *June DMR - Avtex Fibers Site, Front Royal, VA* - Discharge Monitoring Report Received, and notification of new VADEQ Project Manager (sent to FMC and EPA)
- August 10, 2020: *July DMR - Avtex Fibers Site, Front Royal, VA* - DMR Received (sent to FMC and EPA)
- September 8, 2020: *August DMR - Avtex Fibers Site, Front Royal, VA* - DMR Received (sent to FMC and EPA)

#### FMC to EPA

- July 31, 2020: *Avtex - EPA Quarterly Report for April - June 2020* - Quarterly Progress Report for the Avtex Fibers Superfund Site for the Period April 1 to June 30, 2020, which included the *Basin Repair Construction Summary Report* (submitted to VADEQ and EPA)
- September 11, 2020: *Avtex - EPA Quarterly Report for April - June 2020*; no comments or questions (sent to FMC and VADEQ)

#### EPA to FMC

- July 8, 2020: FMC Front Royal - Draft ECs for Transmittal to EPA – EPA's Comment letter regarding draft environmental covenants (sent to FMC and VADEQ)



## **ATTACHMENT 2**

### **SITE-WIDE QUARTERLY INSPECTION REPORTS**

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# Quarterly Inspection Report

Inspected by: M. Harder / D. Delgado

Report No.: 2020-09

Date: 09-24-2020

Areas Inspected: See Map

Questions	Response		Comments and Recommendations
<b>1. Remediation/Restoration Areas</b>			
Is settlement or standing water evident? If Yes, describe the degree of settlement(s) (slight, moderate, significant), record approximate dimensions, and indicate the location(s) on an attached map.	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Small area of standing water noted on roadway to LS-1. All other areas have been repaired.
Is erosion evident? If Yes, describe the type of erosion (rills, gullies), record approximate dimensions (length, width, depth) and indicate location(s) on an attached map.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Are potential leachate seeps evident or migration of contamination? If Yes, describe the nature (size, color, flow rate), record location on an attached map, and photograph.  [Note: Check former seep areas in unnamed tributary north of VB 4-6, check pond area north of VB 9, and check other likely areas (e.g., embankments of VBs, SBs)]	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	See map for locations. Potential seeps: -SE of VB-2&3 (Dry) -NW of VB-7&8 (Dry)
Do landfill/basin embankments show signs of erosion, failure (e.g., cracking, sloughing) or migration of contamination (e.g., seeps, exposed waste)? If Yes, describe the nature (type, size), record location on an attached map, and photograph  [Note: Check river-side of embankments along river, if safe to do so.]	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Is vegetation distressed or are bare areas evident? If Yes, describe the type of disorder (distressed, sparsely vegetated, bare), record approximate dimensions and indicate location(s) on an attached map.	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	Isolated/minor bare areas noted. See map for locations. With few exceptions, vegetation is filling in.

## Quarterly Inspection Report

Inspected by: M. Harder / D. Delgado

Date: 09-24-2020

Report No.: 2020-09

Areas Inspected: See Map

Questions	Response		Comments and Recommendations
Is there woody vegetation greater than 2 inches in diameter or 5 feet in height on the cover system(s)? If Yes, describe where and actions to be taken (refer to Section 4.2 of the O&M Plan).	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Is any other damage evident? If Yes, describe the type of damage(s) and indicate the location(s) on an attached map.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Are obstruction(s) (brush, debris, timber, leaves, sediment) interfering with the proper functioning of ditches, gutters or flumes? If Yes, describe the type(s) of obstruction(s) and indicate the location(s) on an attached map.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	
Is sediment deposited in diversion berms, ditches gutters, flumes or culverts deeper than ¼ of the original channel depth (shown on the contract drawings) or culvert diameter? If Yes, record approximate dimensions and indicate locations on an attached map.	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	



## Quarterly Inspection Report

Inspected by: M. Harder / D. Delgado

Date: 09-24-2020

Report No.: 2020-09

Areas Inspected: See Map

Questions

Response

Comments and Recommendations

### 2. Surface Water Drainage and Erosion Control System

<p>Is erosion evident? If Yes, describe the drainage structure inspected (ditch, gutter, flume, culvert, outfall, rip-rap), the type of erosion (rills, gullies, washouts, slope failure), record approximate dimensions (length, width, depth) and indicate location(s) on an attached map.</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<p>Minor erosion noted in a few isolated areas. Other previously noted areas have been repaired.</p>
<p>Is overall shape, configuration, and alignment of the drainageway as shown on the drawings? If No, describe the type of distortion (damaged, eroded, slope failure), record approximate dimensions and indicate location(s) on an attached map.</p>	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	
<p>Is erosion evident at drainage outlet aprons? If Yes, record approximate dimensions and indicate location(s) on an attached map.</p>	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	

Inspection Checklist (check items that were inspected; document concerns noted;  
refer to attached Drawings for specific areas)

**Viscose Basins 1-3**

<input checked="" type="checkbox"/> Vegetation	<input checked="" type="checkbox"/> Erosion	<input checked="" type="checkbox"/> Settlement	<input checked="" type="checkbox"/> Gas Vents
<input checked="" type="checkbox"/> Culvert Inlets & outlets	<input checked="" type="checkbox"/> Rip-rap channels	<input checked="" type="checkbox"/> Access road near unit	<input type="checkbox"/>

**Viscose Basins 4-6**

<input checked="" type="checkbox"/> Vegetation	<input checked="" type="checkbox"/> Erosion	<input checked="" type="checkbox"/> Settlement	<input checked="" type="checkbox"/> Gas Vents
<input checked="" type="checkbox"/> Culvert Inlets & outlets - N, E, & W of VB 4-6; - Pond W of VB 4-6	<input checked="" type="checkbox"/> Rip-rap channels	<input checked="" type="checkbox"/> Down chutes	<input checked="" type="checkbox"/> Gas Vent Filter & Fence
<input checked="" type="checkbox"/> Former seep area - N of VB 4-6	<input checked="" type="checkbox"/> LS #1 & #2 and Fencing	<input checked="" type="checkbox"/> Access road near unit	<input type="checkbox"/>

**Viscose Basins 7-8**

<input checked="" type="checkbox"/> Vegetation	<input checked="" type="checkbox"/> Erosion	<input checked="" type="checkbox"/> Settlement	<input checked="" type="checkbox"/> Gas Vents
<input checked="" type="checkbox"/> Culvert Inlets & outlets (between VB-1 and VB-7)	<input checked="" type="checkbox"/> Rip-rap channels	<input checked="" type="checkbox"/> Down chutes	<input checked="" type="checkbox"/> Leachate Collection Manhole (MW VB7)
<input checked="" type="checkbox"/> Access road near unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**Viscose Basins 9-11**

<input checked="" type="checkbox"/> Vegetation	<input checked="" type="checkbox"/> Erosion	<input checked="" type="checkbox"/> Settlement	<input checked="" type="checkbox"/> Gas Vents
<input checked="" type="checkbox"/> Drop inlets on VB-11	<input checked="" type="checkbox"/> Culver inlets & outlets (S&W VB-11; N VB-11 & VB-9; and SW VB-10)	<input checked="" type="checkbox"/> Rip-rap channels	<input checked="" type="checkbox"/> Down chutes
<input checked="" type="checkbox"/> Access road near unit	<input checked="" type="checkbox"/> Seep area in pond north of VB-9	<input checked="" type="checkbox"/> VB 9-11 fence and gates	<input checked="" type="checkbox"/> LS #4 and Fencing

**New Landfill**

<input checked="" type="checkbox"/> Vegetation	<input checked="" type="checkbox"/> Erosion	<input checked="" type="checkbox"/> Settlement	<input checked="" type="checkbox"/> Gas Vents
<input checked="" type="checkbox"/> Culvert inlets & outlets (NE & SE of NLF)	<input checked="" type="checkbox"/> Rip-rap channels	<input checked="" type="checkbox"/> Down chutes	<input checked="" type="checkbox"/> LS #3 and Fencing
<input checked="" type="checkbox"/> Access road near unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**SB-1**

<input checked="" type="checkbox"/> Vegetation	<input checked="" type="checkbox"/> Erosion	<input checked="" type="checkbox"/> Settlement	<input checked="" type="checkbox"/> Gas Vents
<input checked="" type="checkbox"/> Culvert inlets & outlets (NE SB-1; SB-2; SE SB-3; NE SB-4; & S SB-4)	<input checked="" type="checkbox"/> Rip-rap channels & outlets by River	<input checked="" type="checkbox"/> Down chutes (SB-1 & SB-4)	<input type="checkbox"/>
<input checked="" type="checkbox"/> Access road near unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Inspection Checklist (check items that were inspected; document concerns noted;  
refer to attached Drawings for specific areas)

**SB-2**

<input checked="" type="checkbox"/> Vegetation	<input checked="" type="checkbox"/> Erosion	<input checked="" type="checkbox"/> Settlement	<input checked="" type="checkbox"/> Culvert inlets & Outlets (S & W Sides)
<input checked="" type="checkbox"/> Berms along River (site & river side)	<input checked="" type="checkbox"/> Rip-rap channels & outlets by River	<input checked="" type="checkbox"/> Access road near unit	<input type="checkbox"/>

**SB-3**

<input checked="" type="checkbox"/> Vegetation	<input checked="" type="checkbox"/> Erosion	<input checked="" type="checkbox"/> Settlement	<input checked="" type="checkbox"/> Gas Vents
<input checked="" type="checkbox"/> Culvert inlets & Outlets (SE))	<input checked="" type="checkbox"/> Rip-rap channels & outlets by River	<input checked="" type="checkbox"/> Drop inlets (W side)	<input checked="" type="checkbox"/> Access Road near unit
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**SB-4**

<input checked="" type="checkbox"/> Vegetation	<input checked="" type="checkbox"/> Erosion	<input checked="" type="checkbox"/> Settlement	<input checked="" type="checkbox"/> Gas Vents
<input checked="" type="checkbox"/> Culvert inlets & outlets (NE & S sides)	<input checked="" type="checkbox"/> Down chutes (S Side)	<input checked="" type="checkbox"/> Drop inlet (N side)	<input checked="" type="checkbox"/> Berms along River (site & river side)
<input checked="" type="checkbox"/> Access road near unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**SB-5**

<input checked="" type="checkbox"/> Vegetation	<input checked="" type="checkbox"/> Erosion	<input checked="" type="checkbox"/> Settlement	<input checked="" type="checkbox"/> Gas Vents
<input checked="" type="checkbox"/> Berms along River and E side	<input checked="" type="checkbox"/> Access Road near unit	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**FAB 1-3**

<input checked="" type="checkbox"/> Vegetation	<input checked="" type="checkbox"/> Erosion	<input checked="" type="checkbox"/> Settlement	<input checked="" type="checkbox"/> Culvert inlets & outlets (E & S FAB1-2; SW FAB3)
<input checked="" type="checkbox"/> Access Road near unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**FAS & FARA**

<input checked="" type="checkbox"/> Vegetation	<input checked="" type="checkbox"/> Erosion	<input checked="" type="checkbox"/> Settlement	<input checked="" type="checkbox"/> Culvert inlets & outlets (E & N FAS; E FARA)
<input checked="" type="checkbox"/> Access Road near unit	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

**EL, PB 1-2, PB-3**

<input checked="" type="checkbox"/> Vegetation	<input checked="" type="checkbox"/> Erosion	<input checked="" type="checkbox"/> Settlement	<input checked="" type="checkbox"/> Rip-rap Channels
<input checked="" type="checkbox"/> Culvert inlets & outlets (E & W EL; NW PB-1-2; S PB-3)	<input checked="" type="checkbox"/> Access Road near unit	<input type="checkbox"/>	<input type="checkbox"/>

**Quarterly Inspection Report Photographic Log**  
**Avtex Superfund Site**  
**Front Royal, Virginia**



**Photo Number:** 1

**Unit:** OU-10

**Basin/Landfill:**

VB-4, 5, & 6

**Date :** 09/24/2020

**Photo Description:** Two areas of standing water adjacent to LS-2.



**Photo Number:** 2

**Unit:** OU-10

**Basin/Landfill:**

VB-4, 5, & 6

**Date :** 09/24/2020

**Photo Description:** Standing water on access path west of VB-4,5, & 6 (path to LS-1)



**Quarterly Inspection Report Photographic Log**  
**Avtex Superfund Site**  
**Front Royal, Virginia**

**Photo Number:** 3

**Unit:** OU-10

**Basin/Landfill:**

VB-4, 5, & 6

**Date :** 09/24/2020



**Photo Description:** Repairs to area of settlement at VB-4, 5, & 6 (new grass planted).

**Photo Number:** 4

**Unit:** OU-10

**Basin/Landfill:**

VB-2&3, and NLF

**Date :** 09/24/2020



**Photo Description:** : Bare soil (~10' x30') with rills southeast of VB-2&3 (Sediment basin between NLF and VB-2&3). Stable and dry, grass returning.



**Quarterly Inspection Report Photographic Log**  
**Avtex Superfund Site**  
**Front Royal, Virginia**

**Photo Number:** 5

**Unit:** OU-7

**Basin/Landfill:**

VB-9, 10, & 11

**Date :** 09/24/2020



**Photo Description:** Area around wells 103/203/303 – dry.

**Photo Number:** 6

**Unit:** OU-7

**Basin/Landfill:**

VB-10

**Date :** 09/24/2020



**Photo Description:** Bare patches and exposed matting at down chute in south side of VB-10.



**Quarterly Inspection Report Photographic Log**  
**Avtex Superfund Site**  
**Front Royal, Virginia**

**Photo Number:** 7

**Unit:** OU-7

**Basin/Landfill:**

VB-10

**Date :** 09/24/2020



**Photo Description:** Bare patches and exposed matting at down chute on south side of VB-10.

**Photo Number:** 8

**Unit:** OU-7

**Basin/Landfill:**

VB-10

**Date :** 09/24/2020



**Photo Description:** Settlement in southern section of VB-10 – repairs complete.

**Quarterly Inspection Report Photographic Log**  
**Avtex Superfund Site**  
**Front Royal, Virginia**

**Photo Number:** 9

**Unit:** OU-7

**Basin/Landfill:**

VB-9

**Date :** 09/24/2020



**Photo Description:** Settlement on previously repaired areas on VB-9 (30' x 40' each)- repairs complete.

**Photo Number:** 10

**Unit:** NTCRA Basins

**Basin/Landfill:**

SB-3

**Date :** 09/24/2020



**Photo Description:** Former area of settlement (20'x40') in front of northernmost inlet between SB-3 and SB-2 – repairs complete.



**Quarterly Inspection Report Photographic Log**  
**Avtex Superfund Site**  
**Front Royal, Virginia**

**Photo Number:** 11

**Unit:** NTCRA Basins

**Basin/Landfill:**

SB-3

**Date :** 09/24/2020



**Photo Description:** Former area of settlement (20'x20') in front of the second to northernmost inlet between SB-3 and SB-2 – repairs complete.

**Photo Number:** 12

**Unit:** NTCRA Basins

**Basin/Landfill:**

FAB-3

**Date :** 09/24/2020



**Photo Description:** Former area of settlement on FAB-3 – repairs complete.

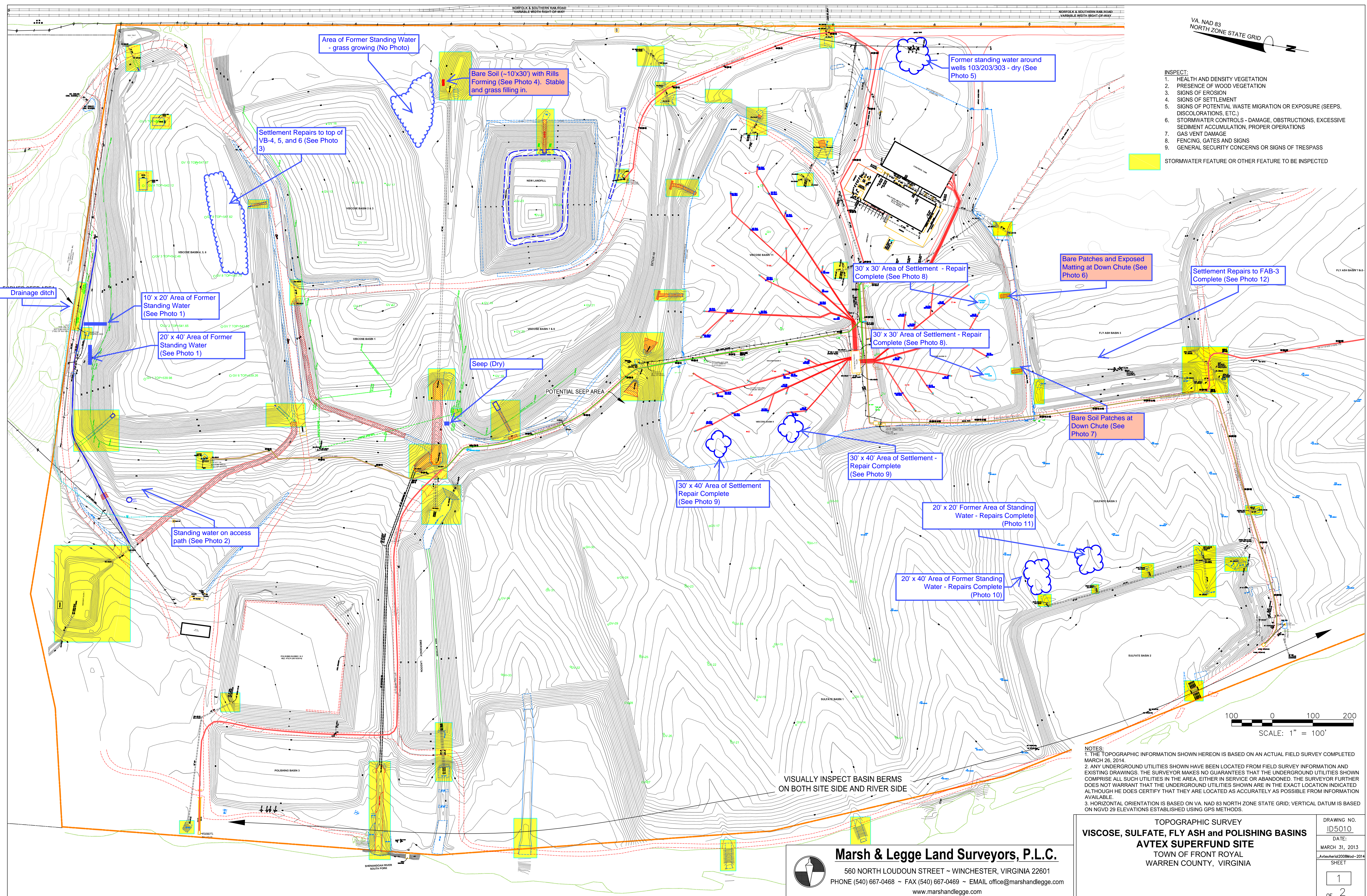
**Quarterly Inspection Report Photographic Log**  
**Avtex Superfund Site**  
**Front Royal, Virginia**

**Photo Number:** 13  
**Unit:** NTCRA Basins  
**Basin/Landfill:**  
FAB-6  
**Date :** 09/24/2020

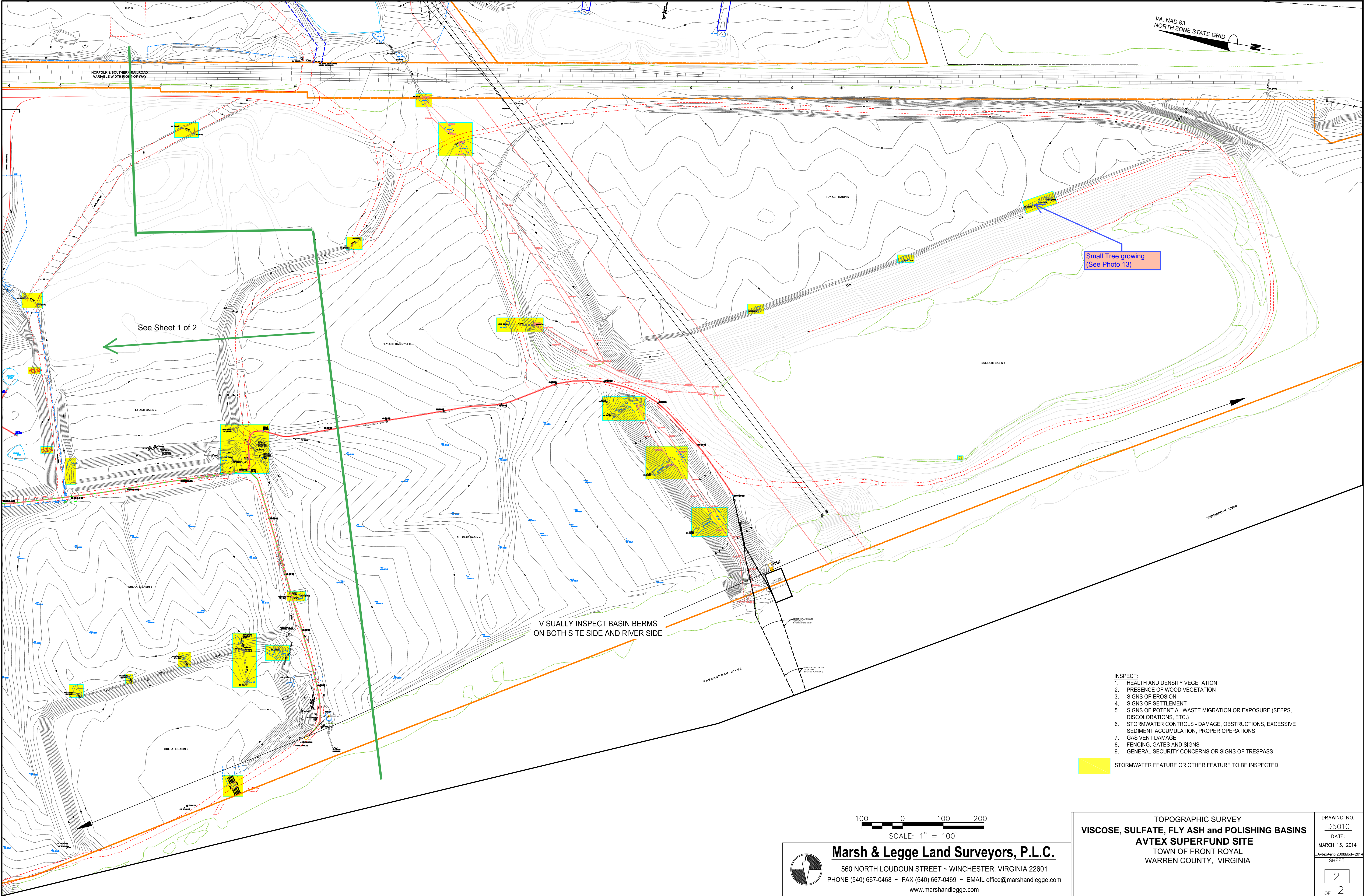


**Photo Description:.** Small tree growing in drainage ditch





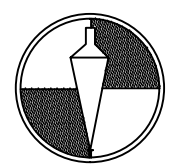




- INSPECT:
1. HEALTH AND DENSITY VEGETATION
  2. PRESENCE OF WOOD VEGETATION
  3. SIGNS OF EROSION
  4. SIGNS OF SETTLEMENT
  5. SIGNS OF POTENTIAL WASTE MIGRATION OR EXPOSURE (SEEPS, DISCOLORATIONS, ETC.)
  6. STORMWATER CONTROLS - DAMAGE, OBSTRUCTIONS, EXCESSIVE SEDIMENT ACCUMULATION, PROPER OPERATIONS
  7. GAS VENT DAMAGE
  8. FENCING, GATES AND SIGNS
  9. GENERAL SECURITY CONCERNS OR SIGNS OF TRESPASS

STORMWATER FEATURE OR OTHER FEATURE TO BE INSPECTED

100 0 100 200  
SCALE: 1" = 100'



**Marsh & Legge Land Surveyors, P.L.C.**

560 NORTH LOUDOUN STREET ~ WINCHESTER, VIRGINIA 22601  
PHONE (540) 667-0468 ~ FAX (540) 667-0469 ~ EMAIL office@marshandlegge.com  
www.marshandlegge.com

TOPOGRAPHIC SURVEY  
**VISCOSE, SULFATE, FLY ASH and POLISHING BASINS**  
**AVTEX SUPERFUND SITE**  
TOWN OF FRONT ROYAL  
WARREN COUNTY, VIRGINIA

DRAWING NO.  
**ID5010**  
DATE:  
MARCH 13, 2014  
Avtex/visr2008Mod-2014  
SHEET  
**2**  
OF **2**





## **ATTACHMENT 3**

### **OU-7 AND SITE PERIMETER AIR MONITORING RESULTS**

Air Monitoring Form  
Avtex Superfund Site  
Front Royal, Virginia

Date 9/23/2020  
Technician M. Harder / D. Delgado

Air Samples Collected?

☐ Yes  
☒ No

Gas Monitoring Devices	Used (Y/N)	Calibrated (Y/N)	Date Calibrated	Initials
Jerome613X (low-level H <sub>2</sub> S)	Y	Y	1/21/2020	MH
MiniRae 3000 (PID)	Y	Y	9/23/2020	MH
MultiRae (PID, O <sub>2</sub> , CO, H <sub>2</sub> S, LEL)	N	N		
Landtec GEM 5000	N	N		

Weather Conditions:

Precipitation (Current): ☐ Rain ☐ Snow ☐ Sleet ☐ Mix ☐ Other ☒ None  
☐ Light ☐ Moderate ☐ Heavy

Current Temperature: 79 °F

Wind Direction (blowing from): SW (N, NE, SW, variable, etc.)

Wind Speed: 6 mph

Barometric Pressure: 29.95 inches

Cloud Cover: ☒ Clear ☐ Partly Cloudy ☐ Mostly Cloudy ☐ Cloudy/Overcast ☐ Foggy

Monitoring Location	Time	H <sub>2</sub> S (ppm)	Organic / VOC (ppm)	CS <sub>2</sub> (ppm)	Methane (%LEL)	Comments
OU-7 Perimeter - (H <sub>2</sub> S Indicator Value = 0.006 ppm)						
N	1603	0.000	0.0	--	--	
NE	1600	0.000	0.0	--	--	
SE	1620	0.000	0.0	--	--	
S	1615	0.000	0.0	--	--	
SW	1611	0.000	0.0	--	--	
NW	1608	0.000	0.0	--	--	
Site Perimeter - (H <sub>2</sub> S Indicator Value = 0.0014 ppm)						
N	1700	0.000	0.0	--	--	
NE	1625	0.000	0.0	--	--	
E	1630	0.000	0.0	--	--	
SE	1635	0.000	0.0	--	--	
S	1641	0.000	0.0	--	--	
SW	1646	0.000	0.0	--	--	
W	1650	0.000	0.0	--	--	
NW	1654	0.000	0.0	--	--	
Downwind (location: <u>NW</u> )	1705	0.000	0.0	--	--	

Activities Occurring on-site that might relate to air emissions:

Groundwater extraction and treatment.

If monitoring results are greater than one or more of above levels & sustained for 1 minute or longer, take following actions:

1. Notify FMC Site Manager, SSO, and EPA/EPA oversight representative;
2. Stop on-site intrusive operations and assess source(s);
3. Step-up work-zone & perimeter monitoring;
4. Perform monitoring the next day to verify levels.

**If H<sub>2</sub>S > 0.1 ppm sustained for 5 minutes at Site Perimeter - Notify Warren County/Front Royal LEPC and Health Department.**

**FIGURE 1**  
**AIR MONITORING LOCATIONS**  
**DURING OU-7 WORK**  
**AVTEX FIBERS SUPERFUND SITE**  
**FRONT ROYAL, VIRGINIA**



TABLE 1

Annual Air Sampling Analytical Results Summary  
 Avtex Site  
 Front Royal, Virginia

Parameters	Units	Sample Location:		OU7-N	OU7-NE	OU-7-NE	OU7-NW	OU7-S	OU7-SE	OU7-SW	PERIM-DOWNWIND (N)
		Sample Date:		08/12/2020	08/12/2020	08/12/2020	08/12/2020	08/12/2020	08/12/2020	08/12/2020	08/12/2020
		EPA RSL (HQ=1)				Duplicate					
		Industrial	Residential								
1-Butanethiol (n-Butyl mercaptan)	ug/m3	--	--	25 U	27 U	27 U	26 U	22 U	22 U	25 U	27 U
1-Isobutanethiol	ug/m3	--	--	25 U	27 U	27 U	26 U	22 U	22 U	25 U	27 U
1-Propanethiol (Propyl mercaptan)	ug/m3	--	--	21 U	23 U	23 U	22 U	18 U	19 U	21 U	23 U
2,5-Dimethylthiophene	ug/m3	--	--	31 U	33 U	33 U	32 U	27 U	28 U	31 U	27 J
2-Ethylthiophene	ug/m3	--	--	31 U	33 U	33 U	32 U	27 U	28 U	31 U	34 U
2-Methyl-2-propanethiol (tert-Butyl mercaptan)	ug/m3	--	--	25 U	27 U	27 U	26 U	22 U	22 U	25 U	27 U
2-Propanethiol (Isopropyl mercaptan)	ug/m3	--	--	21 U	23 U	23 U	22 U	18 U	19 U	21 U	23 U
3-Methylthiophene	ug/m3	--	--	27 U	29 U	29 U	28 U	24 U	24 U	27 U	29 U
Carbon disulfide	ug/m3	3100	730	11 U	29	12	11 U	13	5.8 J	23	6.4 J
Carbonyl sulfide	ug/m3	4400	100	17 U	21	18 U	17 U	14 U	15 U	13 J	18 U
Diethyl disulfide	ug/m3	--	--	17 U	18 U	18 U	17 U	15 U	15 U	17 U	18 U
Diethyl sulfide	ug/m3	--	--	25 U	27 U	27 U	26 U	22 U	22 U	25 U	27 U
Ethyl mercaptan	ug/m3	--	--	17 U	18 U	18 U	18 U	15 U	15 U	17 U	19 U
Hydrogen sulfide	ug/m3	8.8	2.1	13	8.0 J	10 U	9.7 U	8.2 U	8.5 U	6.4 J	5.1 J
Methyl disulfide	ug/m3	--	--	13 U	14 U	14 U	13 U	11 U	12 U	8.5 J	14 U
Methyl ethyl sulfide	ug/m3	--	--	21 U	23 U	23 U	22 U	18 U	19 U	21 U	23 U
Methyl mercaptan	ug/m3	--	--	13 U	14 U	14 U	14 U	12 U	12 U	13 U	14 U
Methyl sulfide	ug/m3	--	--	17 U	18 U	18 U	18 U	15 U	15 U	17 U	19 U
Tetrahydro-Thiophene (Thiophane)	ug/m3	--	--	24 U	26 U	26 U	25 U	21 U	22 U	25 U	26 U
Thiophene	ug/m3	--	--	23 U	25 U	25 U	24 U	20 U	21 U	23 U	25 U

## Footnotes:

U = Not detected at the associated reporting limit.

J = Estimated concentration.

Highlighted results exceed screening criteria

RSL = Regional Screening Level



TABLE 1

Annual Air Sampling Analytical Results Summary  
 Avtex Site  
 Front Royal, Virginia

Parameters	Units	Sample Location:		PERIM-E	PERIM-N	PERIM-N	PERIM-NE	PERIM-NW	PERIM-S	PERIM-SE	PERIM-SW	PERIM-W
		Sample Date:		08/12/2020	08/12/2020	08/12/2020	08/12/2020	08/12/2020	08/12/2020	08/12/2020	08/12/2020	08/12/2020
		EPA RSL (HQ=1)				Duplicate						
		Industrial	Residential									
1-Butanethiol (n-Butyl mercaptan)	ug/m3	--	--	26 U	26 U	25 U	26 U	25 U	25 U	27 U	25 U	27 U
1-Isobutanethiol	ug/m3	--	--	26 U	26 U	25 U	26 U	25 U	25 U	27 U	25 U	27 U
1-Propanethiol (Propyl mercaptan)	ug/m3	--	--	22 U	22 U	21 U	22 U	21 U	21 U	23 U	21 U	23 U
2,5-Dimethylthiophene	ug/m3	--	--	32 U	33 U	31 U	32 U	31 U	31 U	33 U	31 U	33 U
2-Ethylthiophene	ug/m3	--	--	32 U	33 U	31 U	32 U	31 U	31 U	33 U	31 U	33 U
2-Methyl-2-propanethiol (tert-Butyl mercaptan)	ug/m3	--	--	26 U	26 U	25 U	26 U	25 U	25 U	27 U	25 U	27 U
2-Propanethiol (Isopropyl mercaptan)	ug/m3	--	--	22 U	22 U	21 U	22 U	21 U	21 U	23 U	21 U	23 U
3-Methylthiophene	ug/m3	--	--	28 U	29 U	27 U	28 U	27 U	27 U	29 U	27 U	29 U
Carbon disulfide	ug/m3	3100	730	13	6.0 J	12	11 U	11 U	11 U	12	11 U	7.8 J
Carbonyl sulfide	ug/m3	4400	100	13 J	18 U	16 U	17 U	17 U	17 U	18 U	17 U	18 U
Diethyl disulfide	ug/m3	--	--	18 U	18 U	17 U	17 U	17 U	17 U	18 U	17 U	18 U
Diethyl sulfide	ug/m3	--	--	26 U	26 U	25 U	26 U	25 U	25 U	27 U	25 U	27 U
Ethyl mercaptan	ug/m3	--	--	18 U	18 U	17 U	18 U	17 U	17 U	18 U	17 U	19 U
Hydrogen sulfide	ug/m3	8.8	2.1	8.0 J	5.1 J	6.9 J	9.7 U	9.4 U	9.5 U	5.3 J	9.5 U	10 U
Methyl disulfide	ug/m3	--	--	14 U	14 U	13 U	13 U	13 U	13 U	14 U	13 U	14 U
Methyl ethyl sulfide	ug/m3	--	--	22 U	22 U	21 U	22 U	21 U	21 U	23 U	21 U	23 U
Methyl mercaptan	ug/m3	--	--	14 U	14 U	13 U	14 U	13 U	13 U	14 U	13 U	14 U
Methyl sulfide	ug/m3	--	--	18 U	18 U	17 U	18 U	17 U	17 U	18 U	17 U	19 U
Tetrahydro-Thiophene (Thiophane)	ug/m3	--	--	25 U	26 U	24 U	25 U	24 U	25 U	26 U	25 U	26 U
Thiophene	ug/m3	--	--	24 U	25 U	23 U	24 U	23 U	24 U	25 U	23 U	25 U

## Footnotes:

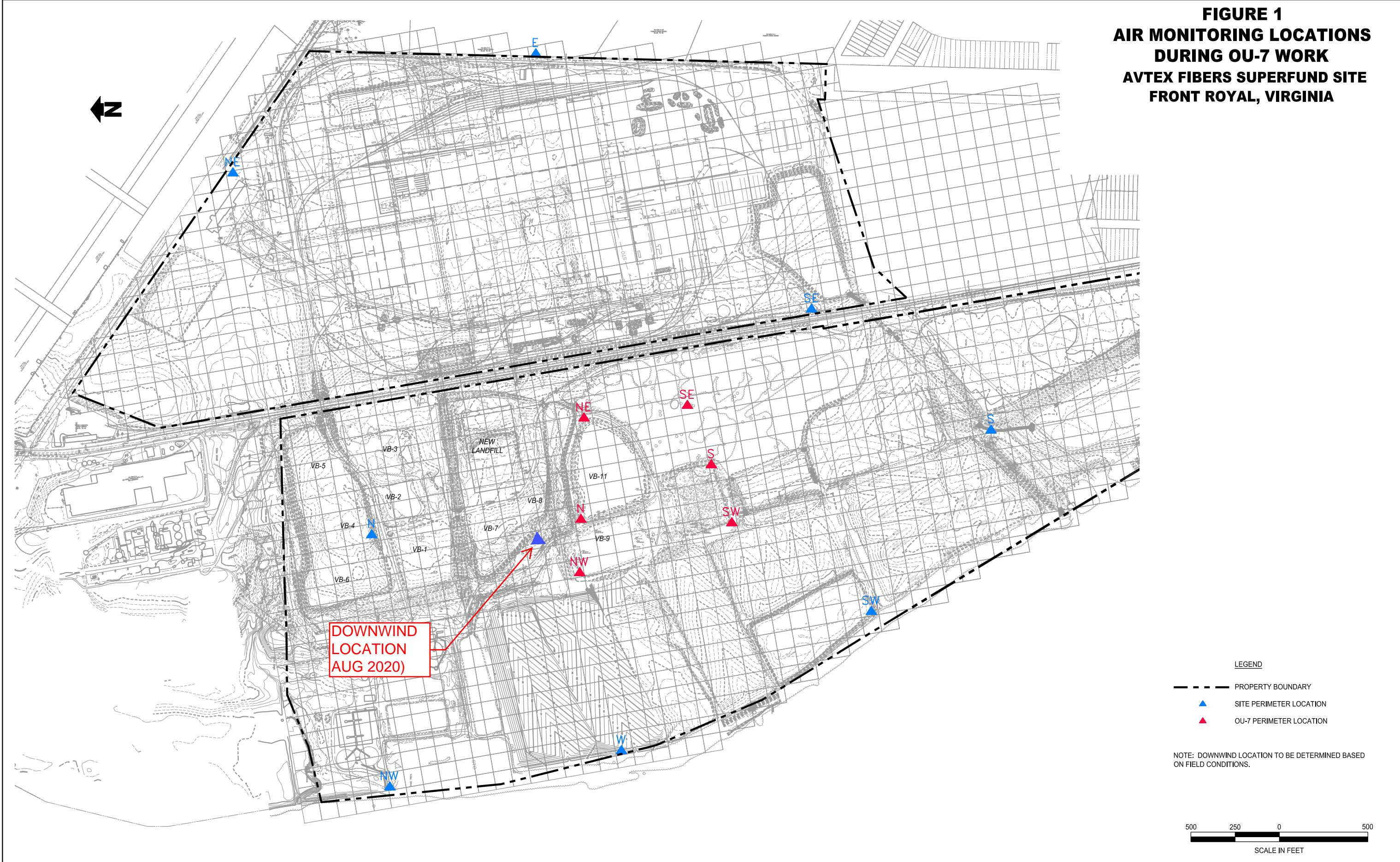
U = Not detected at the associated reporting limit.

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Highlighted results exceed screening criteria

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**FIGURE 1**  
**AIR MONITORING LOCATIONS**  
**DURING OU-7 WORK**  
**AVTEX FIBERS SUPERFUND SITE**  
**FRONT ROYAL, VIRGINIA**



G:\CAD\Drawings\FMC-Avtex-Front-Royal\0122736\A207.dwg



# Memorandum

October 2, 2020

October 8, 2020

To: Michael Robinson

Ref. No.: 11215053

*YU*

From: Linda Waters/cs/4-NF

Tel: 315-802-0343

**Subject: Analytical Results and Full Validation  
Annual Air Monitoring  
FMC Avtex Fibers Superfund Site  
Front Royal, Virginia  
August 2020**

## 1. Introduction

This document details a validation of analytical results for air samples collected in support of the Annual Air Monitoring at the Avtex Fibers Superfund site during August 2020. Samples were submitted to ALS Laboratory, located in Simi Valley, California. A sample collection and analysis summary is presented in Table 1. The validated analytical results are summarized in Table 2. A summary of the analytical methodology is presented in Table 3.

Full Contract Laboratory Program (CLP) equivalent raw data deliverables were provided by the laboratory. Evaluation of the data was based on information obtained from the finished data sheets, raw data, chain of custody forms, calibration data, blank data, duplicate data, recovery data from laboratory control samples (LCS) samples, and field quality assurance/quality control (QA/QC) samples. The assessment of analytical and in-house data included checks for: data consistency (by observing comparability of duplicate analyses), adherence to accuracy and precision criteria, and transmittal errors.

The QA/QC criteria by which these data have been assessed are outlined in the analytical method referenced in Table 3 and applicable guidance from the document entitled "USEPA Contract Laboratory Program National Functional Guidelines for Organic Data Review", United States Environmental Protection Agency (USEPA) 540-R-2017-002, January 2017, subsequently referred to as the "Guidelines" in this Memorandum.

## 2. Sample Holding Time and Preservation

The sample holding time criteria for the analysis is summarized in Table 3. Sample chain of custody documents and analytical reports were used to determine sample holding times. All samples were analyzed within the required holding times.





All samples were properly delivered and stored by the laboratory.

### 3. Initial Calibration – Gas Chromatograph (GC)

In order to quantify organic compounds of interest by GC, calibration of the gas chromatograph over a specific concentration range must be performed. Initially, a calibration curve consisting of a minimum of five concentration levels is analyzed for the method recommended sulfur compounds. Linearity of the calibration curve is acceptable if all RSD values are less than or equal to 25.0 percent.

A retention time standard is analyzed during the initial calibration to identify the target compounds and establish retention time windows. These retention times are then used to identify all compounds of interest in subsequent analyses.

All initial calibration standards were analyzed at the required frequencies. All retention time windows and linearity criteria were satisfied as specified in the method.

### 4. Continuing Calibration – Gas Chromatograph

To ensure that the calibration of the instrument for organic analyses by GC is valid throughout the sample analysis period, continuing calibration standards are analyzed and evaluated on a regular basis. To evaluate the continued linearity of the calibration, %D values are calculated and should not exceed 30 percent.

All continuing calibration standards were analyzed at the required frequency. All %D values and compound retention times met the above criteria, indicating acceptable instrument calibration throughout the analysis period.

### 5. Laboratory Blank Analyses

Method blanks are prepared from a purified matrix and analyzed with investigative samples to determine the existence and magnitude of sample contamination introduced during the analytical procedures

For this study, laboratory method blanks were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.

All method blank results were non-detect, indicating that laboratory contamination was not a factor for this investigation.

### 6. Laboratory Control Sample Analyses

LCS are prepared and analyzed as samples to assess the analytical efficiencies of the method employed, independent of sample matrix effects.

For this study, LCS were analyzed at a minimum frequency of 1 per 20 investigative samples and/or 1 per analytical batch.



The LCS contained the method recommended compounds. All LCS recoveries were within the laboratory control limits, demonstrating acceptable analytical accuracy and precision.

## 7. Field QA/QC Samples

The field QA/QC consisted of 2 field duplicate sample sets.

To assess the analytical and sampling protocol precision, two field duplicate sample sets were collected and submitted "blind" to the laboratory, as specified in Table 1. The RPDs associated with these duplicate samples must be less than 25 percent for air samples. If the reported concentration in either the investigative sample or its duplicate is less than five times the reporting limit (RL), the evaluation criteria is one times the RL value for air samples.

All field duplicate results showed adequate reproducibility, indicating satisfactory sampling and laboratory precision.

## 8. Analyte Reporting

The laboratory reported detected results down to the laboratory's RL for each analyte. Positive analyte detections less than the RL but greater than the MDL were reported as estimated (J) in Table 2 unless qualified otherwise in this memorandum. Non-detect results were presented as non-detect at the RL in Table 2.

## 9. Target Compound Identification

To minimize erroneous compound identification during organic analyses, qualitative criteria including compound retention time were evaluated according to the identification criteria established by the method. The samples identified in Table 1 were reviewed. The compounds reported adhered to the specified identification criteria.

## 10. Conclusion

Based on the assessment detailed in the foregoing, the data summarized in Table 2 are acceptable without qualification.



Table 1

**Sample Collection and Analysis Summary**  
**Annual Air Monitoring**  
**FMC Avtex Fibers Superfund Site**  
**Front Royal, Virginia**  
**August 2020**

Sample Identification	Location	Matrix	Collection Date (mm/dd/yyyy)	Collection Time (hr:min)	Analysis	Comments
					Sulfur compounds (air)	
OU-7-NE	OU-7-NE	Air	08/12/2020	14:03	X	Duplicate of OU-7-NE
DUP2-081120	OU-7-NE	Air	08/12/2020	15:06	X	
OU-7-SE	OU-7-SE	Air	08/12/2020	14:36	X	
OU-7-SW	OU-7-SW	Air	08/12/2020	14:18	X	
OU-7-N	OU7-N	Air	08/12/2020	14:08	X	
OU-7-NW	OU7-NW	Air	08/12/2020	14:11	X	
OU-7-S	OU7-S	Air	08/12/2020	14:21	X	
P-Down-N	PERIM-DOWNWIND (N)	Air	08/12/2020	15:00	X	Duplicate of P-N
P-E	PERIM-E	Air	08/12/2020	15:18	X	
P-N	PERIM-N	Air	08/12/2020	15:04	X	
DUP1-081120	PERIM-N	Air	08/12/2020	14:00	X	
P-NE	PERIM-NE	Air	08/12/2020	15:13	X	
P-NW	PERIM-NW	Air	08/12/2020	14:55	X	
P-S	PERIM-S	Air	08/12/2020	14:40	X	
P-SE	PERIM-SE	Air	08/12/2020	15:21	X	
P-SW	PERIM-SW	Air	08/12/2020	14:46	X	
P-W	PERIM-W	Air	08/12/2020	14:50	X	

Table 2

**Analytical Results Summary  
Annual Air Monitoring  
FMC Avtex Fibers Superfund Site  
Front Royal, Virginia  
August 2020**

<b>Location ID:</b>	<b>OU-7-NE</b>	<b>OU7-N</b>	<b>OU7-NE</b>	<b>OU7-NW</b>	<b>OU7-S</b>	<b>OU7-SE</b>
<b>Sample Name:</b>	<b>DUP2-081120</b>	<b>OU-7-N</b>	<b>OU-7-NE</b>	<b>OU-7-NW</b>	<b>OU-7-S</b>	<b>OU-7-SE</b>
<b>Sample Date:</b>	<b>08/12/2020</b>	<b>08/12/2020</b>	<b>08/12/2020</b>	<b>08/12/2020</b>	<b>08/12/2020</b>	<b>08/12/2020</b>
	<b>Duplicate</b>					
<b>Parameters</b>	<b>Unit</b>					
<b>General Chemistry</b>						
1-Butanethiol (n-Butyl mercaptan)	µg/m3	27 U	25 U	27 U	26 U	22 U
1-Isobutanethiol	µg/m3	27 U	25 U	27 U	26 U	22 U
1-Propanethiol (Propyl mercaptan)	µg/m3	23 U	21 U	23 U	22 U	18 U
2,5-Dimethylthiophene	µg/m3	33 U	31 U	33 U	32 U	27 U
2-Ethylthiophene	µg/m3	33 U	31 U	33 U	32 U	27 U
2-Methyl-2-propanethiol (tert-Butyl mercaptan)	µg/m3	27 U	25 U	27 U	26 U	22 U
2-Propanethiol (Isopropyl mercaptan)	µg/m3	23 U	21 U	23 U	22 U	18 U
3-Methylthiophene	µg/m3	29 U	27 U	29 U	28 U	24 U
Carbon disulfide	µg/m3	12	11 U	29	11 U	13
Carbonyl sulfide	µg/m3	18 U	17 U	21	17 U	14 U
Diethyl disulfide	µg/m3	18 U	17 U	18 U	17 U	15 U
Diethyl sulfide	µg/m3	27 U	25 U	27 U	26 U	22 U
Ethyl mercaptan	µg/m3	18 U	17 U	18 U	18 U	15 U
Hydrogen sulfide	µg/m3	10 U	13	8.0 J	9.7 U	8.2 U
Methyl disulfide	µg/m3	14 U	13 U	14 U	13 U	11 U
Methyl ethyl sulfide	µg/m3	23 U	21 U	23 U	22 U	18 U
Methyl mercaptan	µg/m3	14 U	13 U	14 U	14 U	12 U
Methyl sulfide	µg/m3	18 U	17 U	18 U	18 U	15 U
Tetrahydro-Thiophene (Thiophane)	µg/m3	26 U	24 U	26 U	25 U	21 U
Thiophene	µg/m3	25 U	23 U	25 U	24 U	20 U

## Notes:

U - Not detected at the associated reporting limit

J - Estimated concentration

Table 2

**Analytical Results Summary  
Annual Air Monitoring  
FMC Avtex Fibers Superfund Site  
Front Royal, Virginia  
August 2020**

<b>Location ID:</b>	<b>OU7-SW</b>	<b>PERIM-DOWNWIND (N)</b>	<b>PERIM-E</b>	<b>PERIM-N</b>	<b>PERIM-N</b>	<b>PERIM-NE</b>
<b>Sample Name:</b>	<b>OU-7-SW</b>	<b>P-Down-N</b>	<b>P-E</b>	<b>P-N</b>	<b>DUP1-081120</b>	<b>P-NE</b>
<b>Sample Date:</b>	<b>08/12/2020</b>	<b>08/12/2020</b>	<b>08/12/2020</b>	<b>08/12/2020</b>	<b>08/12/2020</b>	<b>08/12/2020</b>
					<b>Duplicate</b>	

<b>Parameters</b>	<b>Unit</b>						
<b>General Chemistry</b>							
1-Butanethiol (n-Butyl mercaptan)	µg/m3	25 U	27 U	26 U	26 U	25 U	26 U
1-Isobutanethiol	µg/m3	25 U	27 U	26 U	26 U	25 U	26 U
1-Propanethiol (Propyl mercaptan)	µg/m3	21 U	23 U	22 U	22 U	21 U	22 U
2,5-Dimethylthiophene	µg/m3	31 U	27 J	32 U	33 U	31 U	32 U
2-Ethylthiophene	µg/m3	31 U	34 U	32 U	33 U	31 U	32 U
2-Methyl-2-propanethiol (tert-Butyl mercaptan)	µg/m3	25 U	27 U	26 U	26 U	25 U	26 U
2-Propanethiol (Isopropyl mercaptan)	µg/m3	21 U	23 U	22 U	22 U	21 U	22 U
3-Methylthiophene	µg/m3	27 U	29 U	28 U	29 U	27 U	28 U
Carbon disulfide	µg/m3	23	6.4 J	13	6.0 J	12	11 U
Carbonyl sulfide	µg/m3	13 J	18 U	13 J	18 U	16 U	17 U
Diethyl disulfide	µg/m3	17 U	18 U	18 U	18 U	17 U	17 U
Diethyl sulfide	µg/m3	25 U	27 U	26 U	26 U	25 U	26 U
Ethyl mercaptan	µg/m3	17 U	19 U	18 U	18 U	17 U	18 U
Hydrogen sulfide	µg/m3	6.4 J	5.1 J	8.0 J	5.1 J	6.9 J	9.7 U
Methyl disulfide	µg/m3	8.5 J	14 U	14 U	14 U	13 U	13 U
Methyl ethyl sulfide	µg/m3	21 U	23 U	22 U	22 U	21 U	22 U
Methyl mercaptan	µg/m3	13 U	14 U	14 U	14 U	13 U	14 U
Methyl sulfide	µg/m3	17 U	19 U	18 U	18 U	17 U	18 U
Tetrahydro-Thiophene (Thiophane)	µg/m3	25 U	26 U	25 U	26 U	24 U	25 U
Thiophene	µg/m3	23 U	25 U	24 U	25 U	23 U	24 U

## Notes:

U - Not detected at the associated reporting limit

J - Estimated concentration

Table 2

**Analytical Results Summary  
Annual Air Monitoring  
FMC Avtex Fibers Superfund Site  
Front Royal, Virginia  
August 2020**

Location ID:		PERIM-NW	PERIM-S	PERIM-SE	PERIM-SW	PERIM-W
Sample Name:		P-NW	P-S	P-SE	P-SW	P-W
Sample Date:		08/12/2020	08/12/2020	08/12/2020	08/12/2020	08/12/2020
Parameters	Unit					
<b>General Chemistry</b>						
1-Butanethiol (n-Butyl mercaptan)	µg/m3	25 U	25 U	27 U	25 U	27 U
1-Isobutanethiol	µg/m3	25 U	25 U	27 U	25 U	27 U
1-Propanethiol (Propyl mercaptan)	µg/m3	21 U	21 U	23 U	21 U	23 U
2,5-Dimethylthiophene	µg/m3	31 U	31 U	33 U	31 U	33 U
2-Ethylthiophene	µg/m3	31 U	31 U	33 U	31 U	33 U
2-Methyl-2-propanethiol (tert-Butyl mercaptan)	µg/m3	25 U	25 U	27 U	25 U	27 U
2-Propanethiol (Isopropyl mercaptan)	µg/m3	21 U	21 U	23 U	21 U	23 U
3-Methylthiophene	µg/m3	27 U	27 U	29 U	27 U	29 U
Carbon disulfide	µg/m3	11 U	11 U	12	11 U	7.8 J
Carbonyl sulfide	µg/m3	17 U	17 U	18 U	17 U	18 U
Diethyl disulfide	µg/m3	17 U	17 U	18 U	17 U	18 U
Diethyl sulfide	µg/m3	25 U	25 U	27 U	25 U	27 U
Ethyl mercaptan	µg/m3	17 U	17 U	18 U	17 U	19 U
Hydrogen sulfide	µg/m3	9.4 U	9.5 U	5.3 J	9.5 U	10 U
Methyl disulfide	µg/m3	13 U	13 U	14 U	13 U	14 U
Methyl ethyl sulfide	µg/m3	21 U	21 U	23 U	21 U	23 U
Methyl mercaptan	µg/m3	13 U	13 U	14 U	13 U	14 U
Methyl sulfide	µg/m3	17 U	17 U	18 U	17 U	19 U
Tetrahydro-Thiophene (Thiophane)	µg/m3	24 U	25 U	26 U	25 U	26 U
Thiophene	µg/m3	23 U	24 U	25 U	23 U	25 U

## Notes:

U - Not detected at the associated reporting limit

J - Estimated concentration

**Table 3**

**Analytical Method**  
**Annual Air Monitoring**  
**FMC Avtex Fibers Superfund Site**  
**Front Royal, Virginia**  
**August 2020**

<b>Parameter</b>	<b>Method</b>	<b>Matrix</b>	<b>Collection to Analysis (Days)</b>
Sulfur Compounds in Air	ASTM D 5504-12 <sup>(1)</sup>	Air	7

**Notes:**

- ASTM <sup>(1)</sup>
- American Society for Testing and Materials
  - "ASTM Standard Test Method for Determination of Sulfur Compounds in Natural Gas and Gaseous Fuels by Gas Chromatography and Chemiluminescence".





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## LABORATORY REPORT

August 25, 2020

Linda Waters  
GHD  
5788 Widewaters Parkway  
Syracuse, NY 13214

**RE: FMC- Avtex Front Royal, VA / 11215053-001**

Dear Linda:

Enclosed are the results of the samples submitted to our laboratory on August 18, 2020. For your reference, these analyses have been assigned our service request number P2004593.

All analyses were performed according to our laboratory's NELAP and DoD-ELAP-approved quality assurance program. The test results meet requirements of the current NELAP and DoD-ELAP standards, where applicable, and except as noted in the laboratory case narrative provided. For a specific list of NELAP and DoD-ELAP-accredited analytes, refer to the certifications section at [www.alsglobal.com](http://www.alsglobal.com). Results are intended to be considered in their entirety and apply only to the samples analyzed and reported herein.

If you have any questions, please call me at (805) 526-7161.

Respectfully submitted,

**ALS | Environmental**

By Sue Anderson at 11:53 am, Aug 25, 2020

Sue Anderson  
Project Manager



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[www.alsglobal.com](http://www.alsglobal.com)

Client: GHD  
Project: FMC- Avtex Front Royal, VA / 11215053-001

Service Request No: P2004593  
New York Lab ID: 11221

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## CASE NARRATIVE

The samples were received intact under chain of custody on August 18, 2020 and were stored in accordance with the analytical method requirements. Please refer to the sample acceptance check form for additional information. The results reported herein are applicable only to the condition of the samples at the time of sample receipt.

### Sulfur Analysis

The samples were analyzed for twenty sulfur compounds per ASTM D 5504-12 using a gas chromatograph equipped with a sulfur chemiluminescence detector (SCD). All compounds with the exception of hydrogen sulfide and carbonyl sulfide are quantitated against the initial calibration curve for methyl mercaptan. This method is included on the laboratory's NELAP scope of accreditation, however it is not part of the DoD-ELAP accreditation.

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*The results of analyses are given in the attached laboratory report. All results are intended to be considered in their entirety, and ALS Environmental (ALS) is not responsible for utilization of less than the complete report.*

*Use of ALS Environmental (ALS)'s Name. Client shall not use ALS's name or trademark in any marketing or reporting materials, press releases or in any other manner ("Materials") whatsoever and shall not attribute to ALS any test result, tolerance or specification derived from ALS's data ("Attribution") without ALS's prior written consent, which may be withheld by ALS for any reason in its sole discretion. To request ALS's consent, Client shall provide copies of the proposed Materials or Attribution and describe in writing Client's proposed use of such Materials or Attribution. If ALS has not provided written approval of the Materials or Attribution within ten (10) days of receipt from Client, Client's request to use ALS's name or trademark in any Materials or Attribution shall be deemed denied. ALS may, in its discretion, reasonably charge Client for its time in reviewing Materials or Attribution requests. Client acknowledges and agrees that the unauthorized use of ALS's name or trademark may cause ALS to incur irreparable harm for which the recovery of money damages will be inadequate. Accordingly, Client acknowledges and agrees that a violation shall justify preliminary injunctive relief. For questions contact the laboratory.*



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ALS Environmental – Simi Valley

CERTIFICATIONS, ACCREDITATIONS, AND REGISTRATIONS

Agency	Web Site	Number
Alaska DEC	<a href="http://dec.alaska.gov/eh/lab.aspx">http://dec.alaska.gov/eh/lab.aspx</a>	17-019
Arizona DHS	<a href="http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home">http://www.azdhs.gov/preparedness/state-laboratory/lab-licensure-certification/index.php#laboratory-licensure-home</a>	AZ0694
Florida DOH (NELAP)	<a href="http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html">http://www.floridahealth.gov/licensing-and-regulation/environmental-laboratories/index.html</a>	E871020
Louisiana DEQ (NELAP)	<a href="http://www.deq.louisiana.gov/page/la-lab-accreditation">http://www.deq.louisiana.gov/page/la-lab-accreditation</a>	05071
Maine DHHS	<a href="http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml">http://www.maine.gov/dhhs/mecdc/environmental-health/dwp/professionals/labCert.shtml</a>	2018027
Minnesota DOH (NELAP)	<a href="http://www.health.state.mn.us/accreditation">http://www.health.state.mn.us/accreditation</a>	1776326
New Jersey DEP (NELAP)	<a href="http://www.nj.gov/dep/enforcement/oqa.html">http://www.nj.gov/dep/enforcement/oqa.html</a>	CA009
New York DOH (NELAP)	<a href="http://www.wadsworth.org/labcert/elap/elap.html">http://www.wadsworth.org/labcert/elap/elap.html</a>	11221
Oregon PHD (NELAP)	<a href="http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx">http://www.oregon.gov/oha/ph/LaboratoryServices/EnvironmentalLaboratoryAccreditation/Pages/index.aspx</a>	4068-007
Pennsylvania DEP	<a href="http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx">http://www.dep.pa.gov/Business/OtherPrograms/Labs/Pages/Laboratory-Accreditation-Program.aspx</a>	68-03307 (Registration)
PJLA (DoD ELAP)	<a href="http://www.pjlabs.com/search-accredited-labs">http://www.pjlabs.com/search-accredited-labs</a>	65818 (Testing)
Texas CEQ (NELAP)	<a href="http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html">http://www.tceq.texas.gov/agency/qa/env_lab_accreditation.html</a>	T104704413-19-10
Utah DOH (NELAP)	<a href="http://health.utah.gov/lab/lab_cert_env">http://health.utah.gov/lab/lab_cert_env</a>	CA016272019-10
Washington DOE	<a href="http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html">http://www.ecy.wa.gov/programs/eap/labs/lab-accreditation.html</a>	C946
<p>Analyses were performed according to our laboratory's NELAP and DoD-ELAP approved quality assurance program. A complete listing of specific NELAP and DoD-ELAP certified analytes can be found in the certifications section at <a href="http://www.alsglobal.com">www.alsglobal.com</a>, or at the accreditation body's website.</p> <p>Each of the certifications listed above have an explicit Scope of Accreditation that applies to specific matrices/methods/analytes; therefore, please contact the laboratory for information corresponding to a particular certification.</p>		

# ALS ENVIRONMENTAL

## DETAIL SUMMARY REPORT

Client: GHD  
Project ID: FMC- Avtex Front Royal, VA / 11215053-001

Service Request: P2004593

Date Received: 8/18/2020  
Time Received: 11:50

ASTM D 5504-12 - Sulfur Can

Client Sample ID	Lab Code	Matrix	Date Collected	Time Collected	Container ID	Pi1 (psig)	Pf1 (psig)	
OU-7-NE	P2004593-001	Air	8/12/2020	14:03	SSC00318	-2.59	2.91	X
DUP1-081120	P2004593-002	Air	8/12/2020	14:00	SSC00275	-1.82	2.40	X
OU-7-N	P2004593-003	Air	8/12/2020	14:08	SSC00259	-2.13	2.32	X
OU-7-NW	P2004593-005	Air	8/12/2020	14:11	SSC00193	-1.91	3.10	X
OU-7-SW	P2004593-006	Air	8/12/2020	14:18	SSC00399	-1.84	2.83	X
P-Down-N	P2004593-008	Air	8/12/2020	15:00	SSC00287	-2.66	3.00	X
P-N	P2004593-010	Air	8/12/2020	15:04	SSC00009	-2.34	3.03	X
DUP2-081120	P2004593-011	Air	8/12/2020	15:06	SSC00515	-2.88	2.48	X
P-NW	P2004593-012	Air	8/12/2020	14:55	SSC00118	-1.96	2.56	X
P-W	P2004593-013	Air	8/12/2020	14:50	SSC00404	-2.86	2.55	X
P-SW	P2004593-015	Air	8/12/2020	14:46	SSC00461	-2.26	2.23	X
P-S	P2004593-016	Air	8/12/2020	14:40	SSC00094	-2.12	2.55	X
P-E	P2004593-017	Air	8/12/2020	15:18	SSC00440	-2.38	2.69	X
P-NE	P2004593-019	Air	8/12/2020	15:13	SSC00392	-2.03	2.95	X
P-SE	P2004593-020	Air	8/12/2020	15:21	SSC00147	-1.86	3.91	X
OU-7-SE	P2004593-021	Air	8/12/2020	14:36	SSC00355	-0.80	2.31	X
OU-7-S	P2004593-022	Air	8/12/2020	14:21	SSC00230	-0.21	2.43	X



# Air - Chain of Custody Record & Analytical Service Request

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Phone (805) 526-7161

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71004593

Company Name & Address (Reporting Information) PARSONS / GHD 4701 Hedgemore Drive Charlotte, NC 28270				Project Name FMC - Airtex Front Royal, VA				Requested Turnaround Time In Business Days (Surcharges) please circle 1 Day (100%) 2 Day (75%) 3 Day (50%) 4 Day (35%) 5 Day (25%) 10 Day-Standard				ALS Project No. order # 109998			
Project Manager Mike Robinson				Project Number				ALS Contact Sue Anderson				Analysis Method (ASTM D 5504)			
Phone 704-576-7477				P.O. # / Billing Information 452192.02000				Reduced Compounds (ASTM D 5504)				Comments e.g. Actual Preservative or specific instructions			
Fax				Sampler (Print & Sign) Marc Harber				Canister End Pressure "Hg/psig				ENP Pressure			
Email Address for Result Reporting Michael.robinson@parsons.com				Canister ID (Bar code # - AC, SC, etc.)				Canister Start Pressure "Hg				Sample Volume			
Client Sample ID				Time Collected				Flow Controller ID (Bar code # - FC #)				Canister End Pressure "Hg/psig			
OU-7-NE				8/12/20				SFC00318				-27.13			
DUPI-081120				1400				275				-5			
OU-7-N				1408				259				-4			
OU-7-N (Backup)				1406				125				-6			
OU-7-NW				1411				1933				-6			
OU-7-SW				1418				399				-4			
OU-7-SW (Backup)				1416				297				-1			
P-Down-N				1500				287				-24.55			
P-Down-N (Backup)				1502				535				-4			
P-N				1504				009				-4			
Dup2-081120				1506				515				-5			
P-NW				1455				118				-5			
P-W				1450				404				-6			
P-W (Backup)				1452				356				-3			
Report Tier Levels - please select				Tier I - Results (Default if not specified)				Tier II (Results + QC Summaries)				Tier III (Results + QC & Calibration Summaries)			
Relinquished by: (Signature)				Date: 8/12/20				Time: 600				Time: 1150			
Relinquished by: (Signature)				Date:				Time:				Time:			
Chain of Custody Seal: (Circle)				INTACT				BROKEN				ABSENT			
Project Requirements (MRLs, QAPP)				Cooler / Blank Temperature °C											



## Air - Chain of Custody Record & Analytical Service Request

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Page 2 of 2  
P2004593

[illegible]

# ALS Environmental Sample Acceptance Check Form

Client: GHD Work order: P2004593  
 Project: FMC- Avtex Front Royal, VA / 11215053-001  
 Sample(s) received on: 8/18/20 Date opened: 8/18/20 by: DENISE.POSADA

**Note:** This form is used for all samples received by ALS. The use of this form for custody seals is strictly meant to indicate presence/absence and not as an indication of compliance or nonconformity. Thermal preservation and pH will only be evaluated either at the request of the client and/or as required by the method/SOP.

- |   | <b>Yes</b>                          | <b>No</b>                           | <b>N/A</b>                          |
|---|-------------------------------------|-------------------------------------|-------------------------------------|
| 1 Were <b>sample containers</b> properly marked with client sample ID?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 2 Did <b>sample containers</b> arrive in good condition?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 3 Were <b>chain-of-custody</b> papers used and filled out?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 4 Did <b>sample container labels</b> and/or tags agree with custody papers?                                     | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 5 Was <b>sample volume</b> received adequate for analysis?  | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 6 Are samples within specified holding times?   | <input checked="" type="checkbox"/> | <input type="checkbox"/>            | <input type="checkbox"/>            |
| 7 Was proper <b>temperature</b> (thermal preservation) of cooler at receipt adhered to?                         | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 8 Were <b>custody seals</b> on outside of cooler/Box/Container?   | <input type="checkbox"/>            | <input checked="" type="checkbox"/> | <input type="checkbox"/>            |
| Location of seal(s)? _____ Sealing Lid?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were signature and date included?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were seals intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 9 Do containers have appropriate <b>preservation</b> , according to method/SOP or Client specified information? | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Is there a client indication that the submitted samples are <b>pH</b> preserved?                                | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Were <b>VOA vials</b> checked for presence/absence of air bubbles?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Does the client/method/SOP require that the analyst check the sample pH and <u>if necessary</u> alter it?       | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 10 <b>Tubes:</b> Are the tubes capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| 11 <b>Badges:</b> Are the badges properly capped and intact?  | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |
| Are dual bed badges separated and individually capped and intact?   | <input type="checkbox"/>            | <input type="checkbox"/>            | <input checked="" type="checkbox"/> |

Lab Sample ID	Container Description	Required pH *	Received pH	Adjusted pH	VOA Headspace (Presence/Absence)	Receipt / Preservation Comments
P2004593-001.01	6.0 L Silonite Can					
P2004593-002.01	6.0 L Silonite Can					
P2004593-003.01	6.0 L Silonite Can					
P2004593-004.01	6.0 L Silonite Can					
P2004593-005.01	6.0 L Silonite Can					
P2004593-006.01	6.0 L Silonite Can					
P2004593-007.01	6.0 L Silonite Can					
P2004593-008.01	6.0 L Silonite Can					
P2004593-009.01	6.0 L Silonite Can					
P2004593-010.01	6.0 L Silonite Can					
P2004593-011.01	6.0 L Silonite Can					
P2004593-012.01	6.0 L Silonite Can					
P2004593-013.01	6.0 L Silonite Can					
P2004593-014.01	6.0 L Silonite Can					
P2004593-015.01	6.0 L Silonite Can					

Explain any discrepancies: (include lab sample ID numbers): \_\_\_\_\_  
 Project number referenced from SSOW documentation \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

RSK - MEEPP, HCL (pH<2); RSK - CO2, (pH 5-8); Sulfur (pH>4)

## ALS Environmental Sample Acceptance Check Form

Client: GHD

Work order: P2004593

Project: FMC- Avtex Front Royal, VA / 11215053-001

Sample(s) received on: 8/18/20

Date opened: 8/18/20

by: DENISE.POSADA

[illegible]

Explain any discrepancies: (include lab sample ID numbers):

RSK - MEEPP, HCL (pH<2); RSK - CO<sub>2</sub>, (pH 5-8); Sulfur (pH>4)

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** GHD  
**Client Sample ID:** OU-7-NE  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-001

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00318

Date Collected: 8/12/20  
 Time Collected: 14:03  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 06:51  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.59 Final Pressure (psig): 2.91

Container Dilution Factor: 1.45

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	8.0	10	3.0	5.7	7.3	2.2	J
463-58-1	Carbonyl Sulfide	21	18	6.8	8.5	7.3	2.8	
74-93-1	Methyl Mercaptan	ND	14	5.7	ND	7.3	2.9	
75-08-1	Ethyl Mercaptan	ND	18	7.4	ND	7.3	2.9	
75-18-3	Dimethyl Sulfide	ND	18	7.4	ND	7.3	2.9	
75-15-0	Carbon Disulfide	29	11	4.5	9.5	3.6	1.5	
75-33-2	Isopropyl Mercaptan	ND	23	9.0	ND	7.3	2.9	
75-66-1	tert-Butyl Mercaptan	ND	27	11	ND	7.3	2.9	
107-03-9	n-Propyl Mercaptan	ND	23	9.0	ND	7.3	2.9	
624-89-5	Ethyl Methyl Sulfide	ND	23	9.0	ND	7.3	2.9	
110-02-1	Thiophene	ND	25	10	ND	7.3	2.9	
513-44-0	Isobutyl Mercaptan	ND	27	11	ND	7.3	2.9	
352-93-2	Diethyl Sulfide	ND	27	11	ND	7.3	2.9	
109-79-5	n-Butyl Mercaptan	ND	27	11	ND	7.3	2.9	
624-92-0	Dimethyl Disulfide	ND	14	5.6	ND	3.6	1.5	
616-44-4	3-Methylthiophene	ND	29	12	ND	7.3	2.9	
110-01-0	Tetrahydrothiophene	ND	26	10	ND	7.3	2.9	
638-02-8	2,5-Dimethylthiophene	ND	33	13	ND	7.3	2.9	
872-55-9	2-Ethylthiophene	ND	33	13	ND	7.3	2.9	
110-81-6	Diethyl Disulfide	ND	18	14	ND	3.6	2.9	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

Page 1 of 1

**Client:** GHD  
**Client Sample ID:** DUP1-081120  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-002

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00275

Date Collected: 8/12/20  
 Time Collected: 14:00  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 07:10  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -1.82 Final Pressure (psig): 2.40

Container Dilution Factor: 1.33

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	6.9	9.3	2.8	5.0	6.7	2.0	J
463-58-1	Carbonyl Sulfide	ND	16	6.2	ND	6.7	2.5	
74-93-1	Methyl Mercaptan	ND	13	5.2	ND	6.7	2.7	
75-08-1	Ethyl Mercaptan	ND	17	6.8	ND	6.7	2.7	
75-18-3	Dimethyl Sulfide	ND	17	6.8	ND	6.7	2.7	
75-15-0	Carbon Disulfide	12	10	4.1	3.9	3.3	1.3	
75-33-2	Isopropyl Mercaptan	ND	21	8.3	ND	6.7	2.7	
75-66-1	tert-Butyl Mercaptan	ND	25	9.8	ND	6.7	2.7	
107-03-9	n-Propyl Mercaptan	ND	21	8.3	ND	6.7	2.7	
624-89-5	Ethyl Methyl Sulfide	ND	21	8.3	ND	6.7	2.7	
110-02-1	Thiophene	ND	23	9.2	ND	6.7	2.7	
513-44-0	Isobutyl Mercaptan	ND	25	9.8	ND	6.7	2.7	
352-93-2	Diethyl Sulfide	ND	25	9.8	ND	6.7	2.7	
109-79-5	n-Butyl Mercaptan	ND	25	9.8	ND	6.7	2.7	
624-92-0	Dimethyl Disulfide	ND	13	5.1	ND	3.3	1.3	
616-44-4	3-Methylthiophene	ND	27	11	ND	6.7	2.7	
110-01-0	Tetrahydrothiophene	ND	24	9.6	ND	6.7	2.7	
638-02-8	2,5-Dimethylthiophene	ND	31	12	ND	6.7	2.7	
872-55-9	2-Ethylthiophene	ND	31	12	ND	6.7	2.7	
110-81-6	Diethyl Disulfide	ND	17	13	ND	3.3	2.7	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** OU-7-N  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-003

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00259

Date Collected: 8/12/20  
 Time Collected: 14:08  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 07:30  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.13 Final Pressure (psig): 2.32

Container Dilution Factor: 1.35

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	13	9.4	2.8	9.5	6.8	2.0	
463-58-1	Carbonyl Sulfide	ND	17	6.3	ND	6.8	2.6	
74-93-1	Methyl Mercaptan	ND	13	5.3	ND	6.8	2.7	
75-08-1	Ethyl Mercaptan	ND	17	6.9	ND	6.8	2.7	
75-18-3	Dimethyl Sulfide	ND	17	6.9	ND	6.8	2.7	
75-15-0	Carbon Disulfide	ND	11	4.2	ND	3.4	1.4	
75-33-2	Isopropyl Mercaptan	ND	21	8.4	ND	6.8	2.7	
75-66-1	tert-Butyl Mercaptan	ND	25	10	ND	6.8	2.7	
107-03-9	n-Propyl Mercaptan	ND	21	8.4	ND	6.8	2.7	
624-89-5	Ethyl Methyl Sulfide	ND	21	8.4	ND	6.8	2.7	
110-02-1	Thiophene	ND	23	9.3	ND	6.8	2.7	
513-44-0	Isobutyl Mercaptan	ND	25	10	ND	6.8	2.7	
352-93-2	Diethyl Sulfide	ND	25	10	ND	6.8	2.7	
109-79-5	n-Butyl Mercaptan	ND	25	10	ND	6.8	2.7	
624-92-0	Dimethyl Disulfide	ND	13	5.2	ND	3.4	1.4	
616-44-4	3-Methylthiophene	ND	27	11	ND	6.8	2.7	
110-01-0	Tetrahydrothiophene	ND	24	9.7	ND	6.8	2.7	
638-02-8	2,5-Dimethylthiophene	ND	31	12	ND	6.8	2.7	
872-55-9	2-Ethylthiophene	ND	31	12	ND	6.8	2.7	
110-81-6	Diethyl Disulfide	ND	17	13	ND	3.4	2.7	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** OU-7-NW  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-005

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00193

Date Collected: 8/12/20  
 Time Collected: 14:11  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 07:50  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -1.91 Final Pressure (psig): 3.10

Container Dilution Factor: 1.39

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	9.7	2.9	ND	7.0	2.1	
463-58-1	Carbonyl Sulfide	ND	17	6.5	ND	7.0	2.6	
74-93-1	Methyl Mercaptan	ND	14	5.5	ND	7.0	2.8	
75-08-1	Ethyl Mercaptan	ND	18	7.1	ND	7.0	2.8	
75-18-3	Dimethyl Sulfide	ND	18	7.1	ND	7.0	2.8	
75-15-0	Carbon Disulfide	ND	11	4.3	ND	3.5	1.4	
75-33-2	Isopropyl Mercaptan	ND	22	8.7	ND	7.0	2.8	
75-66-1	tert-Butyl Mercaptan	ND	26	10	ND	7.0	2.8	
107-03-9	n-Propyl Mercaptan	ND	22	8.7	ND	7.0	2.8	
624-89-5	Ethyl Methyl Sulfide	ND	22	8.7	ND	7.0	2.8	
110-02-1	Thiophene	ND	24	9.6	ND	7.0	2.8	
513-44-0	Isobutyl Mercaptan	ND	26	10	ND	7.0	2.8	
352-93-2	Diethyl Sulfide	ND	26	10	ND	7.0	2.8	
109-79-5	n-Butyl Mercaptan	ND	26	10	ND	7.0	2.8	
624-92-0	Dimethyl Disulfide	ND	13	5.4	ND	3.5	1.4	
616-44-4	3-Methylthiophene	ND	28	11	ND	7.0	2.8	
110-01-0	Tetrahydrothiophene	ND	25	10	ND	7.0	2.8	
638-02-8	2,5-Dimethylthiophene	ND	32	13	ND	7.0	2.8	
872-55-9	2-Ethylthiophene	ND	32	13	ND	7.0	2.8	
110-81-6	Diethyl Disulfide	ND	17	14	ND	3.5	2.8	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** OU-7-SW  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-006

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00399

Date Collected: 8/12/20  
 Time Collected: 14:18  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 08:09  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -1.84 Final Pressure (psig): 2.83

Container Dilution Factor: 1.36

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	6.4	9.5	2.8	4.6	6.8	2.0	J
463-58-1	Carbonyl Sulfide	13	17	6.3	5.4	6.8	2.6	J
74-93-1	Methyl Mercaptan	ND	13	5.3	ND	6.8	2.7	
75-08-1	Ethyl Mercaptan	ND	17	6.9	ND	6.8	2.7	
75-18-3	Dimethyl Sulfide	ND	17	6.9	ND	6.8	2.7	
75-15-0	Carbon Disulfide	23	11	4.2	7.2	3.4	1.4	
75-33-2	Isopropyl Mercaptan	ND	21	8.5	ND	6.8	2.7	
75-66-1	tert-Butyl Mercaptan	ND	25	10	ND	6.8	2.7	
107-03-9	n-Propyl Mercaptan	ND	21	8.5	ND	6.8	2.7	
624-89-5	Ethyl Methyl Sulfide	ND	21	8.5	ND	6.8	2.7	
110-02-1	Thiophene	ND	23	9.4	ND	6.8	2.7	
513-44-0	Isobutyl Mercaptan	ND	25	10	ND	6.8	2.7	
352-93-2	Diethyl Sulfide	ND	25	10	ND	6.8	2.7	
109-79-5	n-Butyl Mercaptan	ND	25	10	ND	6.8	2.7	
624-92-0	Dimethyl Disulfide	8.5	13	5.2	2.2	3.4	1.4	J
616-44-4	3-Methylthiophene	ND	27	11	ND	6.8	2.7	
110-01-0	Tetrahydrothiophene	ND	25	9.8	ND	6.8	2.7	
638-02-8	2,5-Dimethylthiophene	ND	31	12	ND	6.8	2.7	
872-55-9	2-Ethylthiophene	ND	31	12	ND	6.8	2.7	
110-81-6	Diethyl Disulfide	ND	17	14	ND	3.4	2.7	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** P-Down-N  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-008

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00287

Date Collected: 8/12/20  
 Time Collected: 15:00  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 08:28  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.66 Final Pressure (psig): 3.00

Container Dilution Factor: 1.47

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	5.1	10	3.1	3.6	7.4	2.2	J
463-58-1	Carbonyl Sulfide	ND	18	6.9	ND	7.4	2.8	
74-93-1	Methyl Mercaptan	ND	14	5.8	ND	7.4	2.9	
75-08-1	Ethyl Mercaptan	ND	19	7.5	ND	7.4	2.9	
75-18-3	Dimethyl Sulfide	ND	19	7.5	ND	7.4	2.9	
75-15-0	Carbon Disulfide	6.4	11	4.6	2.1	3.7	1.5	J
75-33-2	Isopropyl Mercaptan	ND	23	9.2	ND	7.4	2.9	
75-66-1	tert-Butyl Mercaptan	ND	27	11	ND	7.4	2.9	
107-03-9	n-Propyl Mercaptan	ND	23	9.2	ND	7.4	2.9	
624-89-5	Ethyl Methyl Sulfide	ND	23	9.2	ND	7.4	2.9	
110-02-1	Thiophene	ND	25	10	ND	7.4	2.9	
513-44-0	Isobutyl Mercaptan	ND	27	11	ND	7.4	2.9	
352-93-2	Diethyl Sulfide	ND	27	11	ND	7.4	2.9	
109-79-5	n-Butyl Mercaptan	ND	27	11	ND	7.4	2.9	
624-92-0	Dimethyl Disulfide	ND	14	5.7	ND	3.7	1.5	
616-44-4	3-Methylthiophene	ND	29	12	ND	7.4	2.9	
110-01-0	Tetrahydrothiophene	ND	26	11	ND	7.4	2.9	
638-02-8	2,5-Dimethylthiophene	27	34	13	6.0	7.4	2.9	J
872-55-9	2-Ethylthiophene	ND	34	13	ND	7.4	2.9	
110-81-6	Diethyl Disulfide	ND	18	15	ND	3.7	2.9	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** P-N  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-010

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00009

Date Collected: 8/12/20  
 Time Collected: 15:04  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 08:48  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.34 Final Pressure (psig): 3.03

Container Dilution Factor: 1.43

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	5.1	10	3.0	3.7	7.2	2.1	J
463-58-1	Carbonyl Sulfide	ND	18	6.7	ND	7.2	2.7	
74-93-1	Methyl Mercaptan	ND	14	5.6	ND	7.2	2.9	
75-08-1	Ethyl Mercaptan	ND	18	7.3	ND	7.2	2.9	
75-18-3	Dimethyl Sulfide	ND	18	7.3	ND	7.2	2.9	
75-15-0	Carbon Disulfide	6.0	11	4.5	1.9	3.6	1.4	J
75-33-2	Isopropyl Mercaptan	ND	22	8.9	ND	7.2	2.9	
75-66-1	tert-Butyl Mercaptan	ND	26	11	ND	7.2	2.9	
107-03-9	n-Propyl Mercaptan	ND	22	8.9	ND	7.2	2.9	
624-89-5	Ethyl Methyl Sulfide	ND	22	8.9	ND	7.2	2.9	
110-02-1	Thiophene	ND	25	9.8	ND	7.2	2.9	
513-44-0	Isobutyl Mercaptan	ND	26	11	ND	7.2	2.9	
352-93-2	Diethyl Sulfide	ND	26	11	ND	7.2	2.9	
109-79-5	n-Butyl Mercaptan	ND	26	11	ND	7.2	2.9	
624-92-0	Dimethyl Disulfide	ND	14	5.5	ND	3.6	1.4	
616-44-4	3-Methylthiophene	ND	29	11	ND	7.2	2.9	
110-01-0	Tetrahydrothiophene	ND	26	10	ND	7.2	2.9	
638-02-8	2,5-Dimethylthiophene	ND	33	13	ND	7.2	2.9	
872-55-9	2-Ethylthiophene	ND	33	13	ND	7.2	2.9	
110-81-6	Diethyl Disulfide	ND	18	14	ND	3.6	2.9	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** DUP2-081120  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-011

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00515

Date Collected: 8/12/20  
 Time Collected: 15:06  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 09:06  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.88      Final Pressure (psig): 2.48

Container Dilution Factor: 1.45

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	10	3.0	ND	7.3	2.2	
463-58-1	Carbonyl Sulfide	ND	18	6.8	ND	7.3	2.8	
74-93-1	Methyl Mercaptan	ND	14	5.7	ND	7.3	2.9	
75-08-1	Ethyl Mercaptan	ND	18	7.4	ND	7.3	2.9	
75-18-3	Dimethyl Sulfide	ND	18	7.4	ND	7.3	2.9	
75-15-0	Carbon Disulfide	12	11	4.5	3.8	3.6	1.5	
75-33-2	Isopropyl Mercaptan	ND	23	9.0	ND	7.3	2.9	
75-66-1	tert-Butyl Mercaptan	ND	27	11	ND	7.3	2.9	
107-03-9	n-Propyl Mercaptan	ND	23	9.0	ND	7.3	2.9	
624-89-5	Ethyl Methyl Sulfide	ND	23	9.0	ND	7.3	2.9	
110-02-1	Thiophene	ND	25	10	ND	7.3	2.9	
513-44-0	Isobutyl Mercaptan	ND	27	11	ND	7.3	2.9	
352-93-2	Diethyl Sulfide	ND	27	11	ND	7.3	2.9	
109-79-5	n-Butyl Mercaptan	ND	27	11	ND	7.3	2.9	
624-92-0	Dimethyl Disulfide	ND	14	5.6	ND	3.6	1.5	
616-44-4	3-Methylthiophene	ND	29	12	ND	7.3	2.9	
110-01-0	Tetrahydrothiophene	ND	26	10	ND	7.3	2.9	
638-02-8	2,5-Dimethylthiophene	ND	33	13	ND	7.3	2.9	
872-55-9	2-Ethylthiophene	ND	33	13	ND	7.3	2.9	
110-81-6	Diethyl Disulfide	ND	18	14	ND	3.6	2.9	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** P-NW  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-012

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00118

Date Collected: 8/12/20  
 Time Collected: 14:55  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 09:25  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -1.96 Final Pressure (psig): 2.56

Container Dilution Factor: 1.35

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	9.4	2.8	ND	6.8	2.0	
463-58-1	Carbonyl Sulfide	ND	17	6.3	ND	6.8	2.6	
74-93-1	Methyl Mercaptan	ND	13	5.3	ND	6.8	2.7	
75-08-1	Ethyl Mercaptan	ND	17	6.9	ND	6.8	2.7	
75-18-3	Dimethyl Sulfide	ND	17	6.9	ND	6.8	2.7	
75-15-0	Carbon Disulfide	ND	11	4.2	ND	3.4	1.4	
75-33-2	Isopropyl Mercaptan	ND	21	8.4	ND	6.8	2.7	
75-66-1	tert-Butyl Mercaptan	ND	25	10	ND	6.8	2.7	
107-03-9	n-Propyl Mercaptan	ND	21	8.4	ND	6.8	2.7	
624-89-5	Ethyl Methyl Sulfide	ND	21	8.4	ND	6.8	2.7	
110-02-1	Thiophene	ND	23	9.3	ND	6.8	2.7	
513-44-0	Isobutyl Mercaptan	ND	25	10	ND	6.8	2.7	
352-93-2	Diethyl Sulfide	ND	25	10	ND	6.8	2.7	
109-79-5	n-Butyl Mercaptan	ND	25	10	ND	6.8	2.7	
624-92-0	Dimethyl Disulfide	ND	13	5.2	ND	3.4	1.4	
616-44-4	3-Methylthiophene	ND	27	11	ND	6.8	2.7	
110-01-0	Tetrahydrothiophene	ND	24	9.7	ND	6.8	2.7	
638-02-8	2,5-Dimethylthiophene	ND	31	12	ND	6.8	2.7	
872-55-9	2-Ethylthiophene	ND	31	12	ND	6.8	2.7	
110-81-6	Diethyl Disulfide	ND	17	13	ND	3.4	2.7	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** P-W  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-013

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00404

Date Collected: 8/12/20  
 Time Collected: 14:50  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 09:45  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.86 Final Pressure (psig): 2.55

Container Dilution Factor: 1.46

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	10	3.1	ND	7.3	2.2	
463-58-1	Carbonyl Sulfide	ND	18	6.8	ND	7.3	2.8	
74-93-1	Methyl Mercaptan	ND	14	5.7	ND	7.3	2.9	
75-08-1	Ethyl Mercaptan	ND	19	7.4	ND	7.3	2.9	
75-18-3	Dimethyl Sulfide	ND	19	7.4	ND	7.3	2.9	
75-15-0	Carbon Disulfide	7.8	11	4.5	2.5	3.7	1.5	J
75-33-2	Isopropyl Mercaptan	ND	23	9.1	ND	7.3	2.9	
75-66-1	tert-Butyl Mercaptan	ND	27	11	ND	7.3	2.9	
107-03-9	n-Propyl Mercaptan	ND	23	9.1	ND	7.3	2.9	
624-89-5	Ethyl Methyl Sulfide	ND	23	9.1	ND	7.3	2.9	
110-02-1	Thiophene	ND	25	10	ND	7.3	2.9	
513-44-0	Isobutyl Mercaptan	ND	27	11	ND	7.3	2.9	
352-93-2	Diethyl Sulfide	ND	27	11	ND	7.3	2.9	
109-79-5	n-Butyl Mercaptan	ND	27	11	ND	7.3	2.9	
624-92-0	Dimethyl Disulfide	ND	14	5.6	ND	3.7	1.5	
616-44-4	3-Methylthiophene	ND	29	12	ND	7.3	2.9	
110-01-0	Tetrahydrothiophene	ND	26	11	ND	7.3	2.9	
638-02-8	2,5-Dimethylthiophene	ND	33	13	ND	7.3	2.9	
872-55-9	2-Ethylthiophene	ND	33	13	ND	7.3	2.9	
110-81-6	Diethyl Disulfide	ND	18	15	ND	3.7	2.9	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** P-SW  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-015

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00461

Date Collected: 8/12/20  
 Time Collected: 14:46  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 10:41  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.26 Final Pressure (psig): 2.23

Container Dilution Factor: 1.36

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	9.5	2.8	ND	6.8	2.0	
463-58-1	Carbonyl Sulfide	ND	17	6.3	ND	6.8	2.6	
74-93-1	Methyl Mercaptan	ND	13	5.3	ND	6.8	2.7	
75-08-1	Ethyl Mercaptan	ND	17	6.9	ND	6.8	2.7	
75-18-3	Dimethyl Sulfide	ND	17	6.9	ND	6.8	2.7	
75-15-0	Carbon Disulfide	ND	11	4.2	ND	3.4	1.4	
75-33-2	Isopropyl Mercaptan	ND	21	8.5	ND	6.8	2.7	
75-66-1	tert-Butyl Mercaptan	ND	25	10	ND	6.8	2.7	
107-03-9	n-Propyl Mercaptan	ND	21	8.5	ND	6.8	2.7	
624-89-5	Ethyl Methyl Sulfide	ND	21	8.5	ND	6.8	2.7	
110-02-1	Thiophene	ND	23	9.4	ND	6.8	2.7	
513-44-0	Isobutyl Mercaptan	ND	25	10	ND	6.8	2.7	
352-93-2	Diethyl Sulfide	ND	25	10	ND	6.8	2.7	
109-79-5	n-Butyl Mercaptan	ND	25	10	ND	6.8	2.7	
624-92-0	Dimethyl Disulfide	ND	13	5.2	ND	3.4	1.4	
616-44-4	3-Methylthiophene	ND	27	11	ND	6.8	2.7	
110-01-0	Tetrahydrothiophene	ND	25	9.8	ND	6.8	2.7	
638-02-8	2,5-Dimethylthiophene	ND	31	12	ND	6.8	2.7	
872-55-9	2-Ethylthiophene	ND	31	12	ND	6.8	2.7	
110-81-6	Diethyl Disulfide	ND	17	14	ND	3.4	2.7	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** P-S  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-016

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00094

Date Collected: 8/12/20  
 Time Collected: 14:40  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 11:04  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.12 Final Pressure (psig): 2.55

Container Dilution Factor: 1.37

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	9.5	2.9	ND	6.9	2.1	
463-58-1	Carbonyl Sulfide	ND	17	6.4	ND	6.9	2.6	
74-93-1	Methyl Mercaptan	ND	13	5.4	ND	6.9	2.7	
75-08-1	Ethyl Mercaptan	ND	17	7.0	ND	6.9	2.7	
75-18-3	Dimethyl Sulfide	ND	17	7.0	ND	6.9	2.7	
75-15-0	Carbon Disulfide	ND	11	4.3	ND	3.4	1.4	
75-33-2	Isopropyl Mercaptan	ND	21	8.5	ND	6.9	2.7	
75-66-1	tert-Butyl Mercaptan	ND	25	10	ND	6.9	2.7	
107-03-9	n-Propyl Mercaptan	ND	21	8.5	ND	6.9	2.7	
624-89-5	Ethyl Methyl Sulfide	ND	21	8.5	ND	6.9	2.7	
110-02-1	Thiophene	ND	24	9.4	ND	6.9	2.7	
513-44-0	Isobutyl Mercaptan	ND	25	10	ND	6.9	2.7	
352-93-2	Diethyl Sulfide	ND	25	10	ND	6.9	2.7	
109-79-5	n-Butyl Mercaptan	ND	25	10	ND	6.9	2.7	
624-92-0	Dimethyl Disulfide	ND	13	5.3	ND	3.4	1.4	
616-44-4	3-Methylthiophene	ND	27	11	ND	6.9	2.7	
110-01-0	Tetrahydrothiophene	ND	25	9.9	ND	6.9	2.7	
638-02-8	2,5-Dimethylthiophene	ND	31	13	ND	6.9	2.7	
872-55-9	2-Ethylthiophene	ND	31	13	ND	6.9	2.7	
110-81-6	Diethyl Disulfide	ND	17	14	ND	3.4	2.7	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** P-E  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-017

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00440

Date Collected: 8/12/20  
 Time Collected: 15:18  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 11:27  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.38 Final Pressure (psig): 2.69

Container Dilution Factor: 1.41

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	8.0	9.8	2.9	5.7	7.1	2.1	J
463-58-1	Carbonyl Sulfide	13	17	6.6	5.4	7.1	2.7	J
74-93-1	Methyl Mercaptan	ND	14	5.5	ND	7.1	2.8	
75-08-1	Ethyl Mercaptan	ND	18	7.2	ND	7.1	2.8	
75-18-3	Dimethyl Sulfide	ND	18	7.2	ND	7.1	2.8	
75-15-0	Carbon Disulfide	13	11	4.4	4.1	3.5	1.4	
75-33-2	Isopropyl Mercaptan	ND	22	8.8	ND	7.1	2.8	
75-66-1	tert-Butyl Mercaptan	ND	26	10	ND	7.1	2.8	
107-03-9	n-Propyl Mercaptan	ND	22	8.8	ND	7.1	2.8	
624-89-5	Ethyl Methyl Sulfide	ND	22	8.8	ND	7.1	2.8	
110-02-1	Thiophene	ND	24	9.7	ND	7.1	2.8	
513-44-0	Isobutyl Mercaptan	ND	26	10	ND	7.1	2.8	
352-93-2	Diethyl Sulfide	ND	26	10	ND	7.1	2.8	
109-79-5	n-Butyl Mercaptan	ND	26	10	ND	7.1	2.8	
624-92-0	Dimethyl Disulfide	ND	14	5.4	ND	3.5	1.4	
616-44-4	3-Methylthiophene	ND	28	11	ND	7.1	2.8	
110-01-0	Tetrahydrothiophene	ND	25	10	ND	7.1	2.8	
638-02-8	2,5-Dimethylthiophene	ND	32	13	ND	7.1	2.8	
872-55-9	2-Ethylthiophene	ND	32	13	ND	7.1	2.8	
110-81-6	Diethyl Disulfide	ND	18	14	ND	3.5	2.8	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** P-NE  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-019

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00392

Date Collected: 8/12/20  
 Time Collected: 15:13  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 11:47  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -2.03      Final Pressure (psig): 2.95

Container Dilution Factor: 1.39

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	9.7	2.9	ND	7.0	2.1	
463-58-1	Carbonyl Sulfide	ND	17	6.5	ND	7.0	2.6	
74-93-1	Methyl Mercaptan	ND	14	5.5	ND	7.0	2.8	
75-08-1	Ethyl Mercaptan	ND	18	7.1	ND	7.0	2.8	
75-18-3	Dimethyl Sulfide	ND	18	7.1	ND	7.0	2.8	
75-15-0	Carbon Disulfide	ND	11	4.3	ND	3.5	1.4	
75-33-2	Isopropyl Mercaptan	ND	22	8.7	ND	7.0	2.8	
75-66-1	tert-Butyl Mercaptan	ND	26	10	ND	7.0	2.8	
107-03-9	n-Propyl Mercaptan	ND	22	8.7	ND	7.0	2.8	
624-89-5	Ethyl Methyl Sulfide	ND	22	8.7	ND	7.0	2.8	
110-02-1	Thiophene	ND	24	9.6	ND	7.0	2.8	
513-44-0	Isobutyl Mercaptan	ND	26	10	ND	7.0	2.8	
352-93-2	Diethyl Sulfide	ND	26	10	ND	7.0	2.8	
109-79-5	n-Butyl Mercaptan	ND	26	10	ND	7.0	2.8	
624-92-0	Dimethyl Disulfide	ND	13	5.4	ND	3.5	1.4	
616-44-4	3-Methylthiophene	ND	28	11	ND	7.0	2.8	
110-01-0	Tetrahydrothiophene	ND	25	10	ND	7.0	2.8	
638-02-8	2,5-Dimethylthiophene	ND	32	13	ND	7.0	2.8	
872-55-9	2-Ethylthiophene	ND	32	13	ND	7.0	2.8	
110-81-6	Diethyl Disulfide	ND	17	14	ND	3.5	2.8	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** P-SE  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-020

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00147

Date Collected: 8/12/20  
 Time Collected: 15:21  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 12:07  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -1.86 Final Pressure (psig): 3.91

Container Dilution Factor: 1.45

CAS #	Compound	Result µg/m <sup>3</sup>	MRL µg/m <sup>3</sup>	MDL µg/m <sup>3</sup>	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	5.3	10	3.0	3.8	7.3	2.2	J
463-58-1	Carbonyl Sulfide	ND	18	6.8	ND	7.3	2.8	
74-93-1	Methyl Mercaptan	ND	14	5.7	ND	7.3	2.9	
75-08-1	Ethyl Mercaptan	ND	18	7.4	ND	7.3	2.9	
75-18-3	Dimethyl Sulfide	ND	18	7.4	ND	7.3	2.9	
75-15-0	Carbon Disulfide	12	11	4.5	3.9	3.6	1.5	
75-33-2	Isopropyl Mercaptan	ND	23	9.0	ND	7.3	2.9	
75-66-1	tert-Butyl Mercaptan	ND	27	11	ND	7.3	2.9	
107-03-9	n-Propyl Mercaptan	ND	23	9.0	ND	7.3	2.9	
624-89-5	Ethyl Methyl Sulfide	ND	23	9.0	ND	7.3	2.9	
110-02-1	Thiophene	ND	25	10	ND	7.3	2.9	
513-44-0	Isobutyl Mercaptan	ND	27	11	ND	7.3	2.9	
352-93-2	Diethyl Sulfide	ND	27	11	ND	7.3	2.9	
109-79-5	n-Butyl Mercaptan	ND	27	11	ND	7.3	2.9	
624-92-0	Dimethyl Disulfide	ND	14	5.6	ND	3.6	1.5	
616-44-4	3-Methylthiophene	ND	29	12	ND	7.3	2.9	
110-01-0	Tetrahydrothiophene	ND	26	10	ND	7.3	2.9	
638-02-8	2,5-Dimethylthiophene	ND	33	13	ND	7.3	2.9	
872-55-9	2-Ethylthiophene	ND	33	13	ND	7.3	2.9	
110-81-6	Diethyl Disulfide	ND	18	14	ND	3.6	2.9	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.



# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** OU-7-SE  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-021

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00355

Date Collected: 8/12/20  
 Time Collected: 14:36  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 12:30  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -0.80 Final Pressure (psig): 2.31

Container Dilution Factor: 1.22

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	8.5	2.5	ND	6.1	1.8	
463-58-1	Carbonyl Sulfide	ND	15	5.7	ND	6.1	2.3	
74-93-1	Methyl Mercaptan	ND	12	4.8	ND	6.1	2.4	
75-08-1	Ethyl Mercaptan	ND	15	6.2	ND	6.1	2.4	
75-18-3	Dimethyl Sulfide	ND	15	6.2	ND	6.1	2.4	
75-15-0	Carbon Disulfide	5.8	9.5	3.8	1.9	3.1	1.2	J
75-33-2	Isopropyl Mercaptan	ND	19	7.6	ND	6.1	2.4	
75-66-1	tert-Butyl Mercaptan	ND	22	9.0	ND	6.1	2.4	
107-03-9	n-Propyl Mercaptan	ND	19	7.6	ND	6.1	2.4	
624-89-5	Ethyl Methyl Sulfide	ND	19	7.6	ND	6.1	2.4	
110-02-1	Thiophene	ND	21	8.4	ND	6.1	2.4	
513-44-0	Isobutyl Mercaptan	ND	22	9.0	ND	6.1	2.4	
352-93-2	Diethyl Sulfide	ND	22	9.0	ND	6.1	2.4	
109-79-5	n-Butyl Mercaptan	ND	22	9.0	ND	6.1	2.4	
624-92-0	Dimethyl Disulfide	ND	12	4.7	ND	3.1	1.2	
616-44-4	3-Methylthiophene	ND	24	9.8	ND	6.1	2.4	
110-01-0	Tetrahydrothiophene	ND	22	8.8	ND	6.1	2.4	
638-02-8	2,5-Dimethylthiophene	ND	28	11	ND	6.1	2.4	
872-55-9	2-Ethylthiophene	ND	28	11	ND	6.1	2.4	
110-81-6	Diethyl Disulfide	ND	15	12	ND	3.1	2.4	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

J = The result is an estimated concentration that is less than the MRL but greater than or equal to the MDL.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** OU-7-S  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P2004593-022

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:  
 Container ID: SSC00230

Date Collected: 8/12/20  
 Time Collected: 14:21  
 Date Received: 8/18/20  
 Date Analyzed: 8/19/20  
 Time Analyzed: 12:50  
 Volume(s) Analyzed: 1.0 ml(s)

Initial Pressure (psig): -0.21 Final Pressure (psig): 2.43

Container Dilution Factor: 1.18

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	8.2	2.5	ND	5.9	1.8	
463-58-1	Carbonyl Sulfide	ND	14	5.5	ND	5.9	2.2	
74-93-1	Methyl Mercaptan	ND	12	4.6	ND	5.9	2.4	
75-08-1	Ethyl Mercaptan	ND	15	6.0	ND	5.9	2.4	
75-18-3	Dimethyl Sulfide	ND	15	6.0	ND	5.9	2.4	
75-15-0	Carbon Disulfide	13	9.2	3.7	4.3	3.0	1.2	
75-33-2	Isopropyl Mercaptan	ND	18	7.3	ND	5.9	2.4	
75-66-1	tert-Butyl Mercaptan	ND	22	8.7	ND	5.9	2.4	
107-03-9	n-Propyl Mercaptan	ND	18	7.3	ND	5.9	2.4	
624-89-5	Ethyl Methyl Sulfide	ND	18	7.3	ND	5.9	2.4	
110-02-1	Thiophene	ND	20	8.1	ND	5.9	2.4	
513-44-0	Isobutyl Mercaptan	ND	22	8.7	ND	5.9	2.4	
352-93-2	Diethyl Sulfide	ND	22	8.7	ND	5.9	2.4	
109-79-5	n-Butyl Mercaptan	ND	22	8.7	ND	5.9	2.4	
624-92-0	Dimethyl Disulfide	ND	11	4.5	ND	3.0	1.2	
616-44-4	3-Methylthiophene	ND	24	9.5	ND	5.9	2.4	
110-01-0	Tetrahydrothiophene	ND	21	8.5	ND	5.9	2.4	
638-02-8	2,5-Dimethylthiophene	ND	27	11	ND	5.9	2.4	
872-55-9	2-Ethylthiophene	ND	27	11	ND	5.9	2.4	
110-81-6	Diethyl Disulfide	ND	15	12	ND	3.0	2.4	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## RESULTS OF ANALYSIS

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**Client:** GHD  
**Client Sample ID:** Method Blank  
**Client Project ID:** FMC- Avtex Front Royal, VA / 11215053-001

ALS Project ID: P2004593  
 ALS Sample ID: P200819-MB

Test Code: ASTM D 5504-12  
 Instrument ID: Agilent 6890A/GC13/SCD  
 Analyst: Gilbert Gutierrez  
 Sample Type: 6.0 L Silonite Canister  
 Test Notes:

Date Collected: NA  
 Time Collected: NA  
 Date Received: NA  
 Date Analyzed: 8/19/20  
 Time Analyzed: 06:29  
 Volume(s) Analyzed: 1.0 ml(s)

CAS #	Compound	Result µg/m³	MRL µg/m³	MDL µg/m³	Result ppbV	MRL ppbV	MDL ppbV	Data Qualifier
7783-06-4	Hydrogen Sulfide	ND	7.0	2.1	ND	5.0	1.5	
463-58-1	Carbonyl Sulfide	ND	12	4.7	ND	5.0	1.9	
74-93-1	Methyl Mercaptan	ND	9.8	3.9	ND	5.0	2.0	
75-08-1	Ethyl Mercaptan	ND	13	5.1	ND	5.0	2.0	
75-18-3	Dimethyl Sulfide	ND	13	5.1	ND	5.0	2.0	
75-15-0	Carbon Disulfide	ND	7.8	3.1	ND	2.5	1.0	
75-33-2	Isopropyl Mercaptan	ND	16	6.2	ND	5.0	2.0	
75-66-1	tert-Butyl Mercaptan	ND	18	7.4	ND	5.0	2.0	
107-03-9	n-Propyl Mercaptan	ND	16	6.2	ND	5.0	2.0	
624-89-5	Ethyl Methyl Sulfide	ND	16	6.2	ND	5.0	2.0	
110-02-1	Thiophene	ND	17	6.9	ND	5.0	2.0	
513-44-0	Isobutyl Mercaptan	ND	18	7.4	ND	5.0	2.0	
352-93-2	Diethyl Sulfide	ND	18	7.4	ND	5.0	2.0	
109-79-5	n-Butyl Mercaptan	ND	18	7.4	ND	5.0	2.0	
624-92-0	Dimethyl Disulfide	ND	9.6	3.9	ND	2.5	1.0	
616-44-4	3-Methylthiophene	ND	20	8.0	ND	5.0	2.0	
110-01-0	Tetrahydrothiophene	ND	18	7.2	ND	5.0	2.0	
638-02-8	2,5-Dimethylthiophene	ND	23	9.2	ND	5.0	2.0	
872-55-9	2-Ethylthiophene	ND	23	9.2	ND	5.0	2.0	
110-81-6	Diethyl Disulfide	ND	12	10	ND	2.5	2.0	

ND = Compound was analyzed for, but not detected above the laboratory detection limit.

MRL = Method Reporting Limit - The minimum quantity of a target analyte that can be confidently determined by the referenced method.

# ALS ENVIRONMENTAL

## LABORATORY CONTROL SAMPLE SUMMARY

Page 1 of 1

**Client:** **GHD**

**Client Sample ID:** **Lab Control Sample**

**Client Project ID:** **FMC- Avtex Front Royal, VA / 11215053-001**

ALS Project ID: P2004593

ALS Sample ID: P200819-LCS

Test Code: ASTM D 5504-12

Instrument ID: Agilent 6890A/GC13/SCD

Analyst: Gilbert Gutierrez

Sample Type: 6.0 L Silonite Canister

Test Notes:

Date Collected: NA

Date Received: NA

Date Analyzed: 8/19/20

Volume(s) Analyzed: NA ml(s)

CAS #	Compound	Spike Amount ppbV	Result ppbV	% Recovery	ALS	Data Qualifier
					Acceptance Limits	
7783-06-4	Hydrogen Sulfide	989	<b>1,050</b>	<b>106</b>	72-122	
463-58-1	Carbonyl Sulfide	1,050	<b>1,030</b>	<b>98</b>	72-121	
74-93-1	Methyl Mercaptan	1,050	<b>1,130</b>	<b>108</b>	74-127	



## **ATTACHMENT 4**

### **GLTP DISCHARGE MONITORING AND INFORMATION**

Table 4.1 Monthly Flow Totals - Third Quarter 2020

Avtex Fibers Superfund Site

Lift Stations, Test Wells and Viscose Basin

July 2020											
Lift Stations Flow Report			Test Wells Flow Report				Viscose Basin Flow Report				
Date	Total LS Flow (MGD)		Date	TW1 Flow (MGD)	TW2 Flow (MGD)		TW3 Flow (MGD)	Date	VB9 Flow (MGD)	VB10 Flow (MGD)	VB 11 Flow (MGD)
7/1/2020	0.010		7/1/2020	0.066	0.000	0.020		7/1/2020	0.002	0.002	0.029
7/2/2020	0.010		7/2/2020	0.062	0.000	0.023		7/2/2020	0.002	0.000	0.029
7/3/2020	0.003		7/3/2020	0.066	0.000	0.005		7/3/2020	0.001	0.000	0.029
7/4/2020	0.010		7/4/2020	0.066	0.000	0.000		7/4/2020	0.000	0.000	0.029
7/5/2020	0.010		7/5/2020	0.065	0.000	0.000		7/5/2020	0.000	0.000	0.029
7/6/2020	0.007		7/6/2020	0.066	0.000	0.000		7/6/2020	0.001	0.001	0.029
7/7/2020	0.007		7/7/2020	0.066	0.000	0.000		7/7/2020	0.002	0.002	0.029
7/8/2020	0.007		7/8/2020	0.065	0.000	0.000		7/8/2020	0.002	0.002	0.029
7/9/2020	0.005		7/9/2020	0.066	0.000	0.000		7/9/2020	0.002	0.000	0.029
7/10/2020	0.004		7/10/2020	0.066	0.000	0.000		7/10/2020	0.002	0.000	0.029
7/11/2020	0.004		7/11/2020	0.066	0.000	0.000		7/11/2020	0.001	0.000	0.029
7/12/2020	0.004		7/12/2020	0.066	0.000	0.000		7/12/2020	0.000	0.000	0.029
7/13/2020	0.004		7/13/2020	0.066	0.000	0.000		7/13/2020	0.000	0.000	0.029
7/14/2020	0.004		7/14/2020	0.066	0.000	0.000		7/14/2020	0.000	0.000	0.029
7/15/2020	0.005		7/15/2020	0.066	0.000	0.003		7/15/2020	0.000	0.000	0.029
7/16/2020	0.005		7/16/2020	0.065	0.000	0.003		7/16/2020	0.001	0.002	0.029
7/17/2020	0.004		7/17/2020	0.059	0.000	0.010		7/17/2020	0.002	0.003	0.029
7/18/2020	0.000		7/18/2020	0.066	0.000	0.013		7/18/2020	0.002	0.003	0.029
7/19/2020	0.000		7/19/2020	0.066	0.000	0.010		7/19/2020	0.002	0.001	0.029
7/20/2020	0.007		7/20/2020	0.065	0.000	0.000		7/20/2020	0.001	0.000	0.029
7/21/2020	0.007		7/21/2020	0.066	0.000	0.000		7/21/2020	0.001	0.000	0.029
7/22/2020	0.000		7/22/2020	0.066	0.000	0.000		7/22/2020	0.001	0.000	0.029
7/23/2020	0.000		7/23/2020	0.066	0.000	0.000		7/23/2020	0.001	0.000	0.029
7/24/2020	0.000		7/24/2020	0.066	0.000	0.000		7/24/2020	0.001	0.000	0.029
7/25/2020	0.000		7/25/2020	0.066	0.000	0.000		7/25/2020	0.001	0.000	0.029
7/26/2020	0.000		7/26/2020	0.066	0.000	0.000		7/26/2020	0.001	0.000	0.029
7/27/2020	0.000		7/27/2020	0.066	0.000	0.000		7/27/2020	0.001	0.000	0.029
7/28/2020	0.010		7/28/2020	0.066	0.000	0.000		7/28/2020	0.001	0.001	0.029
7/29/2020	0.010		7/29/2020	0.066	0.000	0.000		7/29/2020	0.001	0.001	0.029
7/30/2020	0.010		7/30/2020	0.047	0.000	0.000		7/30/2020	0.001	0.001	0.029
7/31/2020	0.010		7/31/2020	0.059	0.000	0.000		7/31/2020	0.001	0.000	0.029



Table 4.1 Monthly Flow Totals - Third Quarter 2020

Avtex Fibers Superfund Site

Lift Stations, Test Wells and Viscose Basin

August 2020											
Lift Stations Flow Report			Test Wells Flow Report					Viscose Basin Flow Report			
Date	Total LS Flow (MGD)		Date	TW1 Flow (MGD)	TW2 Flow (MGD)	TW3 Flow (MGD)		Date	VB9 Flow (MGD)	VB10 Flow (MGD)	VB 11 Flow (MGD)
8/1/2020	0.009		8/1/2020	0.066	0.000	0.000		8/1/2020	0.001	0.000	0.029
8/2/2020	0.003		8/2/2020	0.066	0.000	0.000		8/2/2020	0.001	0.000	0.029
8/3/2020	0.004		8/3/2020	0.066	0.000	0.000		8/3/2020	0.001	0.002	0.029
8/4/2020	0.004		8/4/2020	0.059	0.000	0.000		8/4/2020	0.001	0.003	0.029
8/5/2020	0.004		8/5/2020	0.066	0.000	0.000		8/5/2020	0.001	0.003	0.029
8/6/2020	0.006		8/6/2020	0.066	0.000	0.000		8/6/2020	0.001	0.001	0.029
8/7/2020	0.006		8/7/2020	0.066	0.000	0.000		8/7/2020	0.000	0.001	0.029
8/8/2020	0.001		8/8/2020	0.066	0.000	0.000		8/8/2020	0.000	0.000	0.029
8/9/2020	0.001		8/9/2020	0.066	0.000	0.000		8/9/2020	0.000	0.000	0.029
8/10/2020	0.001		8/10/2020	0.043	0.000	0.000		8/10/2020	0.000	0.000	0.029
8/11/2020	0.011		8/11/2020	0.059	0.000	0.000		8/11/2020	0.000	0.000	0.029
8/12/2020	0.011		8/12/2020	0.066	0.000	0.000		8/12/2020	0.000	0.001	0.029
8/13/2020	0.009		8/13/2020	0.059	0.000	0.000		8/13/2020	0.000	0.002	0.029
8/14/2020	0.003		8/14/2020	0.066	0.000	0.000		8/14/2020	0.000	0.002	0.029
8/15/2020	0.003		8/15/2020	0.066	0.000	0.000		8/15/2020	0.000	0.001	0.029
8/16/2020	0.003		8/16/2020	0.066	0.000	0.000		8/16/2020	0.000	0.001	0.029
8/17/2020	0.004		8/17/2020	0.066	0.000	0.000		8/17/2020	0.000	0.001	0.029
8/18/2020	0.002		8/18/2020	0.059	0.000	0.000		8/18/2020	0.000	0.001	0.029
8/19/2020	0.001		8/19/2020	0.066	0.000	0.000		8/19/2020	0.000	0.001	0.029
8/20/2020	0.001		8/20/2020	0.066	0.000	0.000		8/20/2020	0.000	0.001	0.029
8/21/2020	0.010		8/21/2020	0.066	0.000	0.000		8/21/2020	0.000	0.001	0.029
8/22/2020	0.010		8/22/2020	0.059	0.000	0.000		8/22/2020	0.000	0.001	0.029
8/23/2020	0.006		8/23/2020	0.066	0.000	0.000		8/23/2020	0.000	0.001	0.029
8/24/2020	0.003		8/24/2020	0.066	0.000	0.000		8/24/2020	0.000	0.001	0.029
8/25/2020	0.003		8/25/2020	0.066	0.000	0.000		8/25/2020	0.000	0.000	0.029
8/26/2020	0.003		8/26/2020	0.066	0.000	0.000		8/26/2020	0.000	0.001	0.029
8/27/2020	0.003		8/27/2020	0.066	0.000	0.000		8/27/2020	0.000	0.001	0.029
8/28/2020	0.001		8/28/2020	0.066	0.000	0.000		8/28/2020	0.000	0.000	0.029
8/29/2020	0.000		8/29/2020	0.066	0.000	0.000		8/29/2020	0.000	0.000	0.029
8/30/2020	0.000		8/30/2020	0.066	0.000	0.000		8/30/2020	0.000	0.000	0.029
8/31/2020	0.000		8/31/2020	0.066	0.000	0.000		8/31/2020	0.000	0.000	0.029

Table 4.1 Monthly Flow Totals - Third Quarter 2020

Avtex Fibers Superfund Site

Lift Stations, Test Wells and Viscose Basin

September 2020											
Lift Stations Flow Report			Test Wells Flow Report					Viscose Basin Flow Report			
Date	Total LS Flow (MGD)		Date	TW1 Flow (MGD)	TW2 Flow (MGD)	TW3 Flow (MGD)		Date	VB9 Flow (MGD)	VB10 Flow (MGD)	VB 11 Flow (MGD)
9/1/2020	0.009		9/1/2020	0.046	0.000	0.000		9/1/2020	0.000	0.000	0.029
9/2/2020	0.010		9/2/2020	0.053	0.000	0.000		9/2/2020	0.000	0.000	0.029
9/3/2020	0.009		9/3/2020	0.051	0.000	0.000		9/3/2020	0.000	0.001	0.029
9/4/2020	0.002		9/4/2020	0.059	0.000	0.000		9/4/2020	0.000	0.001	0.029
9/5/2020	0.000		9/5/2020	0.066	0.000	0.000		9/5/2020	0.000	0.001	0.029
9/6/2020	0.000		9/6/2020	0.066	0.000	0.000		9/6/2020	0.000	0.000	0.029
9/7/2020	0.000		9/7/2020	0.066	0.000	0.000		9/7/2020	0.000	0.001	0.029
9/8/2020	0.011		9/8/2020	0.066	0.000	0.000		9/8/2020	0.000	0.001	0.029
9/9/2020	0.011		9/9/2020	0.066	0.000	0.000		9/9/2020	0.000	0.000	0.029
9/10/2020	0.006		9/10/2020	0.066	0.000	0.000		9/10/2020	0.000	0.000	0.029
9/11/2020	0.000		9/11/2020	0.043	0.000	0.000		9/11/2020	0.000	0.000	0.029
9/12/2020	0.000		9/12/2020	0.059	0.000	0.000		9/12/2020	0.000	0.000	0.029
9/13/2020	0.000		9/13/2020	0.066	0.000	0.000		9/13/2020	0.000	0.000	0.029
9/14/2020	0.030		9/14/2020	0.066	0.000	0.000		9/14/2020	0.000	0.000	0.029
9/15/2020	0.044		9/15/2020	0.027	0.000	0.000		9/15/2020	0.000	0.000	0.029
9/16/2020	0.044		9/16/2020	0.059	0.000	0.000		9/16/2020	0.000	0.001	0.029
9/17/2020	0.007		9/17/2020	0.066	0.000	0.000		9/17/2020	0.000	0.002	0.029
9/18/2020	0.003		9/18/2020	0.059	0.000	0.000		9/18/2020	0.000	0.002	0.029
9/19/2020	0.002		9/19/2020	0.066	0.000	0.000		9/19/2020	0.000	0.002	0.029
9/20/2020	0.002		9/20/2020	0.066	0.000	0.000		9/20/2020	0.000	0.002	0.029
9/21/2020	0.002		9/21/2020	0.066	0.000	0.000		9/21/2020	0.000	0.001	0.029
9/22/2020	0.001		9/22/2020	0.066	0.000	0.000		9/22/2020	0.000	0.001	0.029
9/23/2020	0.001		9/23/2020	0.066	0.000	0.000		9/23/2020	0.000	0.001	0.029
9/24/2020	0.001		9/24/2020	0.066	0.000	0.000		9/24/2020	0.000	0.001	0.029
9/25/2020	0.001		9/25/2020	0.066	0.000	0.000		9/25/2020	0.000	0.001	0.029
9/26/2020	0.001		9/26/2020	0.066	0.000	0.000		9/26/2020	0.000	0.001	0.029
9/27/2020	0.001		9/27/2020	0.049	0.000	0.000		9/27/2020	0.000	0.001	0.029
9/28/2020	0.001		9/28/2020	0.000	0.000	0.000		9/28/2020	0.000	0.001	0.029
9/29/2020	0.003		9/29/2020	0.000	0.000	0.000		9/29/2020	0.000	0.001	0.029
9/30/2020	0.003		9/30/2020	0.047	0.000	0.000		9/30/2020	0.000	0.001	0.029

**Table 4.2 Monthly Flow Totals - Third Quarter 2020**  
**Avtex Fibers Superfund Site**  
**Site Rainfall Data - July 1 - September 30, 2020**

Month	Average Rainfall for Winchester, VA (in)*	Average Site Rainfall 1990-2013 (in)	2006 Actual Rainfall (in)	2007 Actual Rainfall (in)	2008 Actual Rainfall (in)	2009 Actual Rainfall (in)	2010 Actual Rainfall (in)	2011 Actual Rainfall (in)	2012 Actual Rainfall (in)	2013 Actual Rainfall (in)	2014 Actual Rainfall (in)	2015 Actual Rainfall (in)	2016 Actual Rainfall (in)	2017 Actual Rainfall (in)	2018 Actual Rainfall (in)	2019 Actual Rainfall (in)	2020 Actual Rainfall (in)	Percent of Average Site Rainfall (%)
January	2.4	2.7	2.0	1.2	1.0	1.4	3.35	0.9	2.0	3.8	1.1	1.4	1.2	2.5	1.8	3.9	3.1	115%
February	2.5	2.3	1.7	1.9	2.3	0.0	4.35	1.4	2.3	0.9	3.2	0.7	2.2	0.8	2.0	3.4	1.8	77%
March	3.1	3.6	0.1	3.7	2.9	1.5	5.7	4.6	1.9	3.9	2.3	1.7	1.0	2.4	0.8	4.6	1.6	44%
April	3.1	3.2	2.8	3.4	6.2	3.2	1.59	6.5	2.5	1.3	1.5	2.9	1.3	1.7	2.4	2.8	3.7	116%
May	3.7	3.8	1.0	1.9	5.2	5.8	3.25	5.6	3.6	2.4	7.2	1.6	3.9	7.0	7.7	5.1	2.9	76%
June	3.9	4.4	9.7	3.5	4.3	4.6	0.6	4.0	3.6	5.2	1.5	3.9	3.8	1.3	9.9	1.6	5.1	115%
July	3.9	3.4	2.2	1.7	3.8	3.0	1.8	3.1	4.3	1.9	4.6	1.8	5.4	6.7	6.1	2.7	2.6	76%
August	3.5	3.1	1.3	2.8	3.5	2.1	3.3	3.4	5.2	2.6	3.7	1.0	2.3	2.1	4.1	4.8	5.0	160%
September	3.1	4.7	6.1	2.0	4.3	1.3	5.7	5.5	4.9	2.5	1.6	3.6	6.1	1.3	5.9	0.3	5.5	117%
October	3.2	3.0	4.3	4.1	1.2	2.7	0.65	3.9	4.3	5.1	5.17	1.65	0.6	3.5	1.3	2.0		
November	3.1	2.9	5.2	1.6	2.5	3.7	1.8	3.0	1.1	1.6	1.83	1.36	0.8	0.9	4.7	0.6		
December	2.5	2.6	0.7	2.8	1.4	5.0	2.0	3.6	1.55	1.5	3.02	2.46	1.5	0.4	3.7	0.3		
<b>Totals to</b>	<b>37.9</b>	<b>39.6</b>	<b>36.9</b>	<b>30.4</b>	<b>38.5</b>	<b>34.2</b>	<b>34.1</b>	<b>45.2</b>	<b>37.0</b>	<b>32.8</b>	<b>36.7</b>	<b>24.1</b>	<b>30.0</b>	<b>30.4</b>	<b>50.3</b>	<b>32.1</b>	<b>31.2</b>	<b>79%</b>

\* Source: National Climate Data Center TD 9641 Clim 81



## **ATTACHMENT 5**

### **ADDENDUM TO VISCOSE BASIN REPAIRS AND GAS VENT EXTENSIONS MEMORANDUM**

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# ADDENDUM TO VISCOSE BASIN REPAIRS AND GAS VENT EXTENSIONS MEMORANDUM

## AVTEX FIBERS SUPERFUND SITE FRONT ROYAL, VIRGINIA

Prepared For:



FMC Corporation  
2929 Walnut Street  
Philadelphia, PA 19104

Prepared By:



301 Plainfield Road, Suite 350  
Syracuse, New York 13212

OCTOBER 2020

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**3.0 REFERENCES..... 3**

## LIST OF ATTACHMENTS

Figure 1 – 2020 Basin Settlement Repairs

Attachment A - Photo Log

## 1.0 PURPOSE

---

The former Avtex Fibers Superfund Site in Front Royal, Virginia, (Site) primarily manufactured viscose-based rayon, polyester, and polypropylene. Although extensive remediation has been performed to date, and the Site is currently in the operation and maintenance (O&M) phase, there remain below-ground constituents of concern including: carbon disulfide, hydrogen sulfide, methane, and the heavy metals arsenic, cadmium, and chromium.

As detailed in the *Groundwater Leachate Extraction System Operations, Maintenance and Monitoring Manual* and the *Sitewide Post Closure Care Operation and Maintenance Plan* (Sitewide O&M Plan 2015), Viscous Basin (VB) gas vents (GV) are routinely inspected, and an annual topographic survey is conducted throughout the Site basins to monitor settlement. Yearly survey results (2016-2019) indicated settling above established allowable limits in VB 4 ,6, 9 and 10, and Fly Ash Basin (FAB) 3. Existing high-density polyethylene GVs located in the Sulfate Basins (SB) had also settled with the basins and required extensions. These areas and associated well systems contained therein required elevation adjustment to correct differential settlement. The associated well systems included extraction well piping, well system containment boxes and GVs. FMC submitted to United States Environmental Protection Agency (USEPA), a *Basins Repair Work Plan* dated August 2019, to demonstrate the repairs needed. The Work Plan was reviewed and approved prior to commencement of work activities. Approval was received in a letter dated August 13, 2019 from Mr. Jeffrey Thomas, USEPA Region III.

As discussed in the *Viscous Basin Repairs and Gas Vent Extensions Memorandum* (August 2020) submitted with the 2020 second quarter progress report, three small areas remained to be repaired. This construction report summarizes the completion of the remainder of the basin repair work field activities that were conducted to address the remaining three areas.

As required by the Sitewide O&M Plan (Parsons 2015), this summary report will be included in the next annual report submitted to the USEPA and the Virginia Department of Environmental Quality.

## 2.0 Scope of Work

---

The scope of work outlined in the *Basin Repair Work Plan* (August 2019) included the following tasks:

- Extend extraction well piping
- Adjust well system containment boxes
- Place approved soils as needed
- Place compost into top 3 to 4 inches of fill
- Seed and mulch disturbed areas
- Install GV extensions
- Abandon wells as approved by the USEPA
- Conduct final as-built survey

The activities described above were largely completed in May and June of 2020, with the exception of three small areas identified in the Work Plan as Areas FAB-3A, SB3A, and SB3B (**Figure 1**). Due to their location and drainage features, these three areas were impacted by rains from mid to late June. Wet conditions did not facilitate grading at these areas; as such, they were not completed at that time due to safety precautions and concerns of causing further damage. Following a period of dry weather in September 2020, these three areas were graded to final fill lines. Restoration of these three areas occurred from September 8, 2020 through September 11, 2020, as described below.

---

## 2.1 Basin Repairs

---

The basin areas FAB-3A, SB3A, and SB3B were repaired by placing soil at appropriate depths to adjust the grade and facilitate drainage. The placed soil was covered with a mushroom compost approved for use at the Site, and an appropriate seed mix was applied with protective straw to assist in the restoration of the vegetative cover in the disturbed areas. A photo log of this work is included in **Attachment A**.

### 2.1.1 Soil Emplacement

The remainder of the repairs to areas FAB-3A, SB3A, and SB3B were graded to approximate fill lines, as well as to facilitate drainage, in July 2020. Additional soil placement to bring the areas up to grade was conducted in accordance with the specifications noted in Section 02200 of the *Final Remedial Design* (ERM 2012).

Soil material for the fill areas was delivered to the Site and stockpiled/screened prior to use. The soil came from the previously approved Rappawan Inc. Quarry, Front Royal, Virginia, which is the same quarry (i.e., the same source material) as used for historical Site repairs. During the first repair event, the contractor provided the on-site screening equipment to screen stockpiled fill soil to 2-inch minus. This material was used for all repairs conducted in May and June, as well as the remaining repairs that were conducted in September. The fill was transported from the stockpile area to the affected basins, where the soil was placed to elevation and machine-track compacted to the staked survey elevation. Approximately 451.98 cubic yards of soil were placed.

### 2.1.2 Compost (Topsoil), Seed and Mulch Emplacement

Compost, which was obtained locally from the approved compost vendor (PAK Transport Inc, LLC), was placed to the final grades indicated in the Work Plan for the three areas. Finished grades for fill had a relatively uniform smooth surface with a tolerance of  $\pm 0.1$ -foot from the elevations specified. The compost was uniformly placed and mixed in at the designated areas and evenly spread to reach final grades. The spreading was performed in such a manner that planting could proceed with little additional soil preparation or tillage, with compost placed so as to have an even visual distribution. As in the repairs conducted in May and June of 2020, the topsoil and amended cover soil contained from 2% to 20% organic matter. The areas were then reseeded with the appropriate seed mix for the given areas and had straw mulch placed as described in the approved Work Plan.

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## 2.2 Final As-Built Survey

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The final as-built survey of the final grading elevations of the three areas was completed by Marsh & Legge during the week of September 28, 2020. Results of the as-built survey will be included in a future submittal to USEPA.

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## 3.0 References

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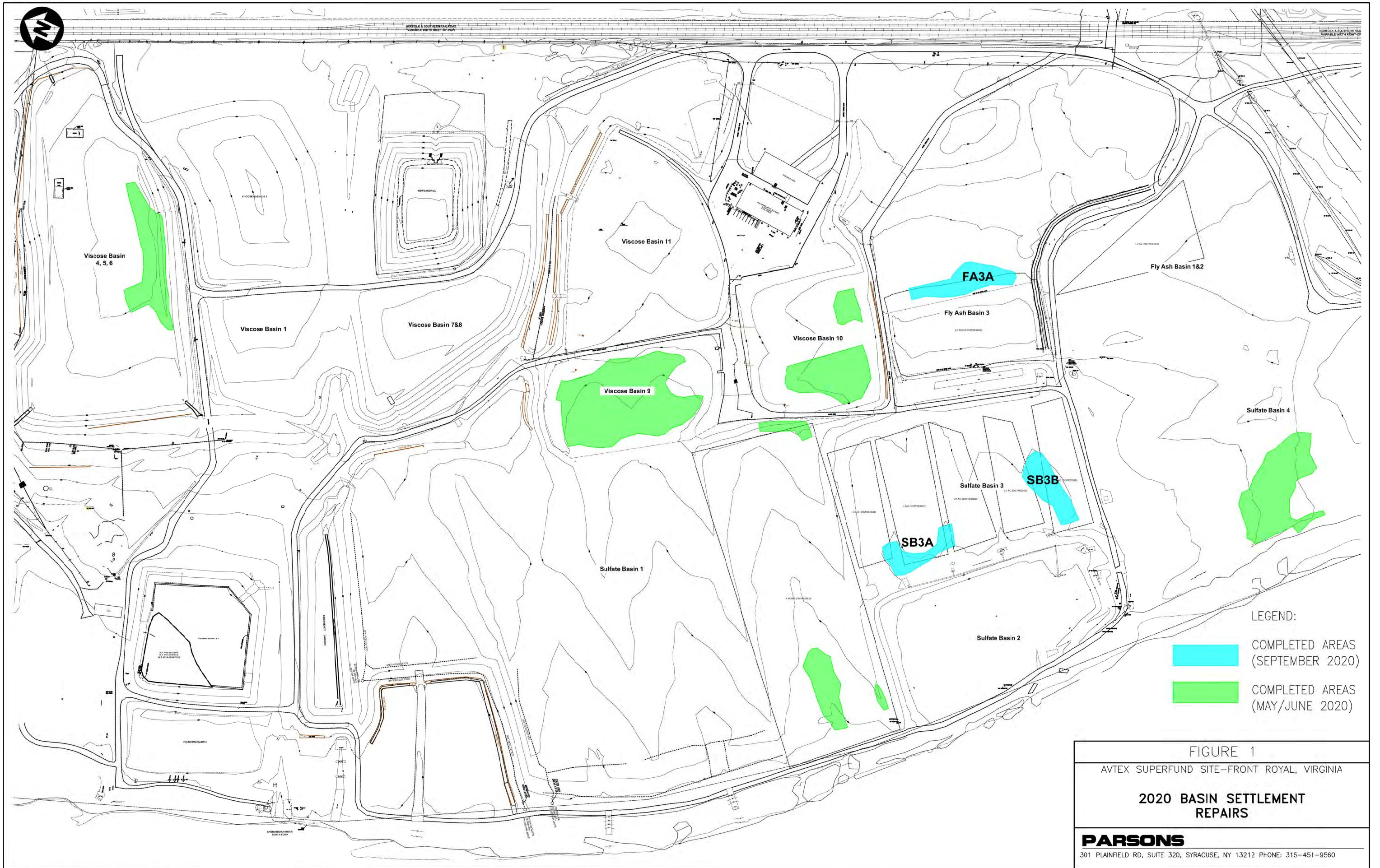
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- ERM. 2012. *Final Remedial Design- Viscose Basin Cap System and Groundwater & Leachate Extraction Operable Unit 7, Avtex Fibers Superfund Site Front Royal, Virginia*. Environmental Resources Management, February.
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- Parsons Corporation. 2019. *Basin Repairs Work Plan Avtex Fibers Superfund Site Front Royal, Virginia*. August.
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Parsons Corporation. 2020. *Viscous Basin Repairs and Gas Vent Extensions Memorandum*. August.

## **FIGURES**

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## **ATTACHMENT A**

### **PHOTO LOG**

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## Front Royal Basin Repairs



Date: 9/11/2020

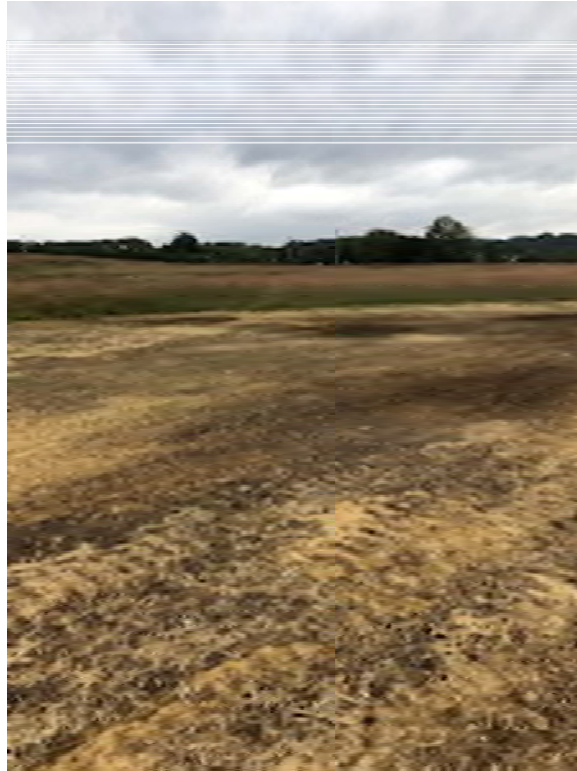
Photo Description: FAB #3 Looking North



Date: 9/11/2020

Photo Description: FAB #3 Looking South

## Front Royal Basin Repairs



Date: 9/11/2020

Photo Description: FAB #3 Looking East



Date: 9/11/2020

Photo Description: SB #3 Looking North

## Front Royal Basin Repairs



Date: 9/11/2020

Photo Description: SB #3 Looking West